

FM 54-10
Copy 2

RESCINDED Per DA

pamphlet 310-1
1 June 1985

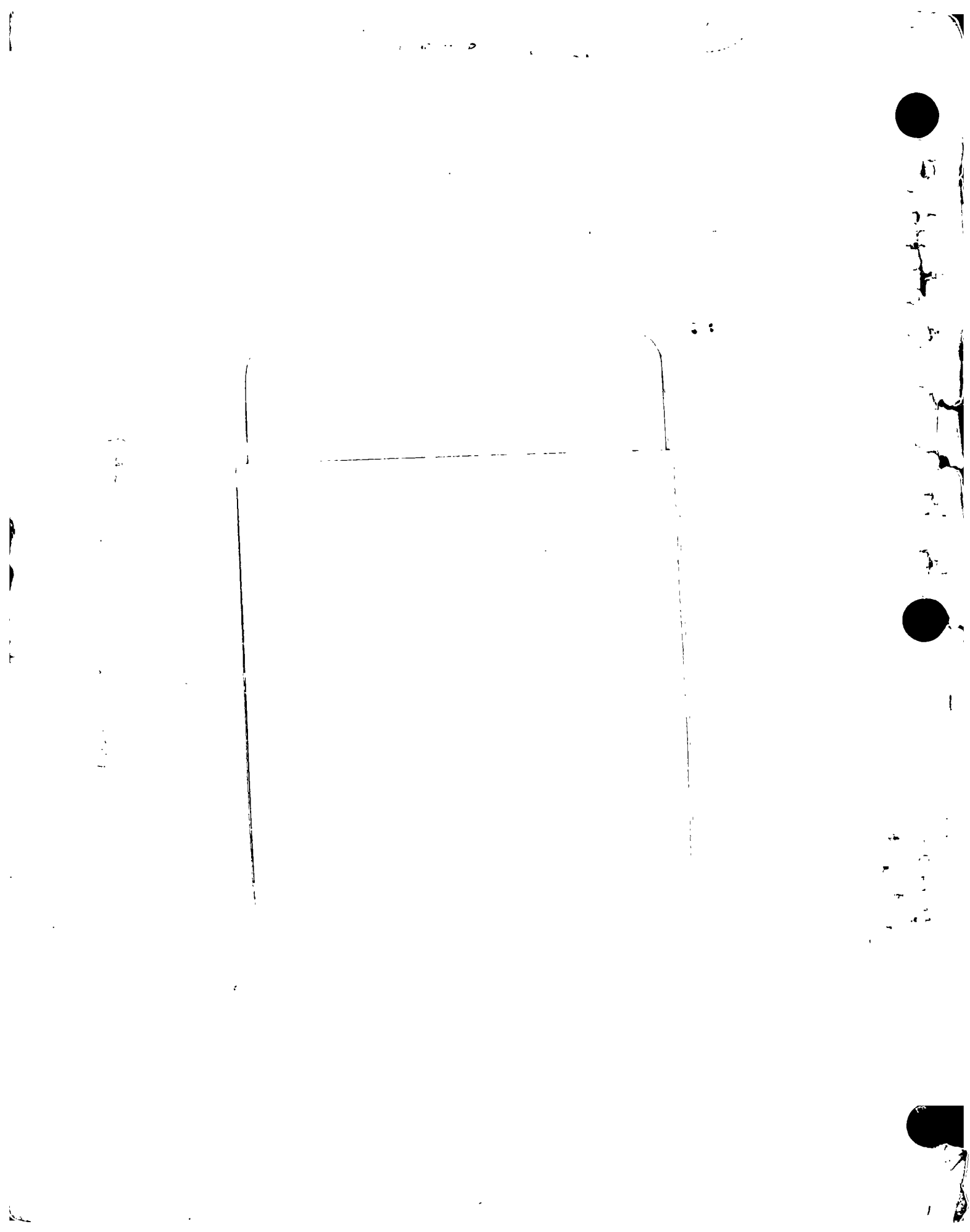
FM 54-10

LOGISTICS-



AN OVERVIEW OF THE TOTAL SYSTEM

RETURN TO THE ARMY LIBRARY
ROOM 1A518 PENTAGON
WASHINGTON, D.C. 20310



RESCINDED Per DA

pamphlet 310-1
10 June 1985

FM 54-10.

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 April 1977

LOGISTICS - AN OVERVIEW OF THE TOTAL SYSTEM

	Page
CHAPTER 1. THE LOGISTIC MISSION	
The Modern Battlefield	1-1
The Mission	1-2
Life Cycle Management Model	1-3
Integrated Logistic Support (ILS)	1-7
Highlights	1-9
CHAPTER 2. LOGISTICS DESCRIBED	
Logistic Functions	2-2
Echelons of Logistics	2-3
Logistic Responsibilities	2-3
Highlights	2-7
CHAPTER 3. SUPPLY	
Classes of Supply	3-1
Basic Supply Terminology	3-3
Supply Flow	3-4
Ammunition Supply - Arming the Weapon System	3-8
Petroleum Supply - Fueling the Weapon System	3-10
Highlights	3-11

CHAPTER 4. MAINTENANCE

Army Wholesale Materiel Maintenance.....	4-2
Army-in-the-Field Materiel Maintenance	4-3
Support Forward	4-4
Highlights	4-6

CHAPTER 5. TRANSPORTATION

Airlift and Sealift Services	5-2
Transportation Service in the Theater	5-2
Transportation Movement Management.....	5-3
Intransit Asset Visibility..... ^p	5-4
Containerization.....	5-5
Heavy Equipment Transporters	5-7
Highlights.....	5-8

CHAPTER 6. SERVICES AND FACILITIES

Services	6-1
Facilities	6-4

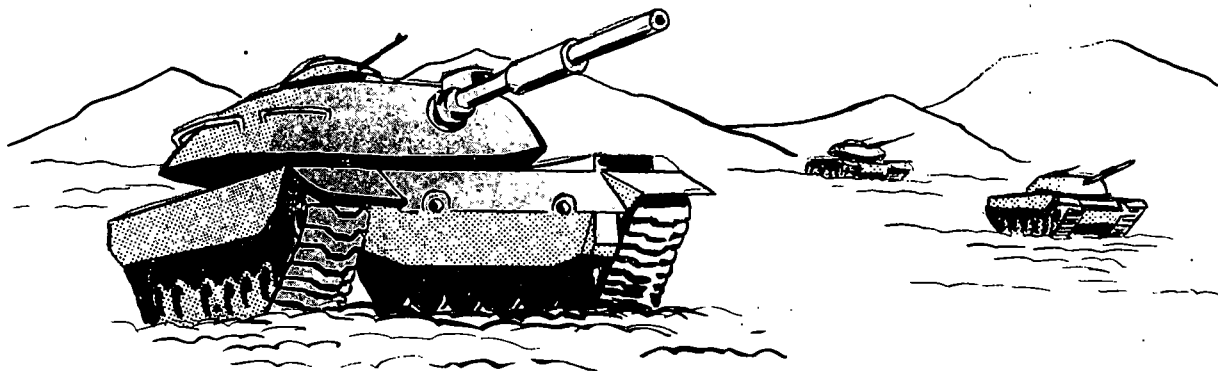
CHAPTER 7. LOGISTIC COMMAND AND CONTROL

Organizational Command and Control	7-1
ADP Support	7-3

CHAPTER 1

THE LOGISTIC MISSION**The Modern Battlefield**

In the last thirty years, significant changes have occurred in the development and proliferation of highly sophisticated, highly effective, weapon systems. The increased firepower, accuracy, range, and mobility made possible by technological advancement has created a battlefield environment characterized by extremely high degrees of weapon system lethality and mobility. In this environment, devastating losses will most likely occur on both sides in a relatively short period of time. As an example, in the Mid-East War of 1973, the level of destructiveness approached that once attributed only to nuclear weapons. Both sides sustained devastating losses, approaching 50 percent in less than two weeks of combat. Not only does today's Army face the prospect of a highly intense and lethal battlefield environment, it must also face the likelihood of being significantly outnumbered. In order to be successful, we must obtain and maintain the maximum combat effectiveness of all Army forces. *Our force must be more effective, man for man, weapon for weapon, and unit for unit, than the opposition.* The measure of this effectiveness is combat power. Combat power is derived from maneuver and firepower. However, a force cannot achieve these without proper logistic support. Therefore, logistics must also be considered an essential element of combat power. The measure of logistic effectiveness is the availability of battlefield-operable weapon systems.



WE MUST DEVELOP AND MAINTAIN MAXIMUM COMBAT POWER THROUGH THE SUPPORT OF WEAPON SYSTEMS.

**WE MUST: ARM IT
FUEL IT
FIX IT**

WE MUST: SUPPORT FORWARD

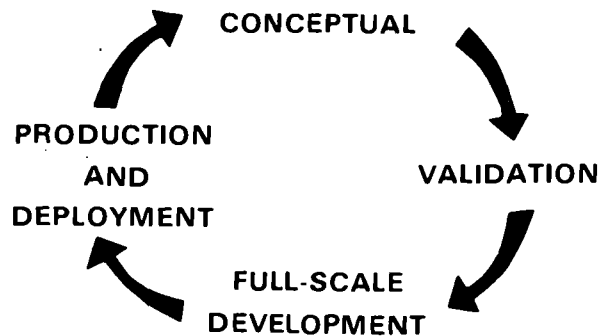
FM 100-5, Operations, sets forth the basic concepts of Army doctrine. It is the capstone of the Army's system of field manuals and presents principles for accomplishing the Army's primary mission of winning the land battle.

The Mission

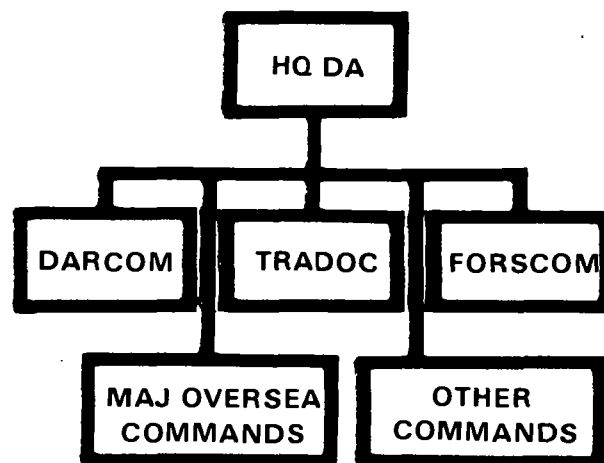
Logistics is essentially the movement and support of forces. Logistics includes the following principal functions; supply, maintenance, transportation, services, and facilities. Basically, the mission of logistics can be described as: *TO DEVELOP AND MAINTAIN MAXIMUM COMBAT POWER THROUGH THE SUPPORT OF WEAPON SYSTEMS!* The people performing logistic functions must insure that the critical weapon systems are supplied with sufficient fuel and ammunition and that they are quickly repaired when damaged or otherwise inoperable. In other words, they must: (1) *ARM THE WEAPON SYSTEM*, (2) *FUEL THE WEAPON SYSTEM*, and (3) *FIX THE WEAPON SYSTEM!* Due to the nature of the battlefield they must accomplish this support where the action is taking place. They must *SUPPORT FORWARD*. Forward support for the combat force is one of the most important objectives of the logistics system. All elements of the system exist to make effective forward support possible. The weapon systems are armed, fueled, and fixed as close to the point of employment as the tactical situation will permit. Critically needed supplies are hauled to the forward elements, swiftly in a tactically sound manner. Likewise, highly skilled technicians are transported to the place where their expertise is needed. Logistic command and control insures a measured response to the support requirement where it is needed, when it is needed. *The commander must think in terms of weapon system support, not generalized logistic support.*

Life Cycle Management Model

The preceding paragraphs have emphasized that the ultimate mission of logistics is to insure the operational readiness of weapons systems on the battlefield. However, in order to accomplish that mission, a tremendous effort must take place both in the field and in the CONUS base. We need to go further and discuss what takes place away from the battlefield. We need to look at the overall logistic system. One of the best ways of doing this is through use of the life cycle management model. This is especially true from a *weapon system* perspective. With this model, all of the key activities involved in the development and deployment of an item of materiel or a weapon system are broken down into four major phases: *conceptual*, *validation*, *full-scale development*, and *production and deployment*. Throughout this process, constant interaction occurs between the *combat developer* (US Army Training and Doctrine Command) (TRADOC), the *matériel developer* (US Army Materiel Development and Readiness Command) (DARCOM), the *trainer* (TRADOC for individuals and all major commands for units), and the *user* (FORSCOM and major overseas commands) in order to insure that the system under development will most effectively satisfy the Army's needs. Each of the phases is described briefly in the following paragraphs.



MATERIEL LIFE CYCLE



DARCOM = MATERIEL DEVELOPER

TRADOC = COMBAT DEVELOPER

TRADOC + FORSCOM = TRAINER

FORSCOM + MACOMs = USERS

**DEVELOP AND VALIDATE
REQUIREMENTS**

Conceptual Phase - This is the first phase of the life cycle of materiel. Here combat developers examine potential and actual threats, technological forecasts, joint and Army plans, and information provided by materiel users in the field in order to determine the doctrine, operational capabilities, and specific materiel requirements which will provide the Army with the equipment and the operational and support concepts necessary to accomplish its mission. Task forces of Army experts are formed to challenge the validity of stated requirements and to explore the feasibility, cost effectiveness, and operational acceptability of alternate approaches to meeting operational requirements.

**RESOLVE LOGISTIC PROBLEMS
VERIFY DESIGN CONCEPTS
ANALYZE TRADE OFFS
PREPARE DEVELOPMENT
CONTRACTS**

Validation Phase - This phase consists of those steps required to validate and/or resolve technical aspects, logistic alternatives, life cycle cost estimates, and schedules identified in the conceptual phase. This is accomplished by either competitive prototyping, sole-source contractor, or by in-house laboratories. Prototypes may be used to verify preliminary design and engineering concepts, trade-off proposals, environmental impact, and operational and technical factors in preparation of solicitations and contracts for full-scale development.

**DEVELOP
TEST
TYPE CLASSIFY**

Full-scale Development Phase - During this phase, the system, including all items necessary for its support, is fully developed, engineered, fabricated, tested, and type classified. Concurrently, nonmateriel aspects of the system such as training plans and materials, field manuals, technical manuals, tables of organization and equipment, and basis of issue plans are developed.

Production and Deployment Phase -

In this phase, operational units are trained, equipment is procured and distributed, and logistic support is provided. Product improvements are applied to the system as required to maintain operational and support superiority. When the operational need for the system no longer exists or has changed to such a degree that the system can no longer satisfy the need, the system is phased out of use and reclassified as contingency or declared obsolete and, subsequently, processed through property disposal channels. Thus, with the changing operational need, the cycle continues into a new conceptual phase to develop new materiel to meet new operational requirements.

Major management decisions are made at appropriate milestones during the development process. Appropriate level reviews are made to provide a sound but flexible decision-making process. These reviews are made by: The Defense Systems Acquisition Review Council (DSARC), the Army Systems Acquisition Review Council (ASARC), and at in-process reviews. The DSARC reviews major programs such as a new tank, as determined by the Secretary or a Deputy Secretary of Defense. The ASARC reviews all major programs reviewed by the DSARC plus any others designated by Headquarters, DA. In-process reviews are made for nonmajor programs such as a new tent or helmet. Reviews by ASARC and DSARC are made between each of the life cycle phases and determine whether or not the developmental process continues. In-process reviews are held at the completion of the validation phase, at the completion of the full-scale development phase and prior to entry into full-scale production.

TRAIN UNITS

PROCURE AND DISTRIBUTE

PROVIDE LOGISTIC SUPPORT

DEVELOPMENTAL DECISIONS ARE MADE BY:

DSARC

ASARC

IPR

IF SATISFACTORY TEST RESULTS ARE ACHIEVED, TESTS ARE NOT REPEATED. IF SIGNIFICANT DEFICIENCIES ARE REFLECTED, THE SYSTEM WILL NOT MOVE INTO THE NEXT PHASE UNTIL CORRECTIONS HAVE BEEN MADE AND VERIFIED IN A RETEST.

DT/OT II MUST DEMONSTRATE THAT ALL KEY CRITERIA CAN BE SATISFIED

One of the most important aspects of the decision-making process concerns materiel testing. Tests are conducted throughout the life cycle, especially prior to each management decision point (i.e., DSARC, ASARC, IPR). These tests are of two types: development tests and operational tests. Development tests (DT) are technically oriented tests conducted by contractors, Government laboratories, engineering agencies, or the Test and Evaluation Command (TECOM) of DARCOM. Operational tests (OT) are used to determine operational suitability and logistic support requirements. These are planned and conducted by the materiel user, i.e., FORSCOM organizations, or by representatives of the materiel user, i.e., TRADOC or the Operational Test and Evaluation Agency (OTEA). Development tests and operational tests are generally conducted simultaneously.

DT/OT I is conducted as the culmination of the validation phase of materiel development. This test provides part of the basis for selecting one or more contractors to enter the full-scale development phase. The primary purpose of the operational test portion of DT/OT I is to determine the tactical suitability of the system from a conceptual standpoint.

DT/OT II is conducted as the culmination of the full-scale development phase. This is a coordinated test to satisfy the needs of users, developers, and contractors while maximizing the benefit of resources expended. Independence of test design and evaluation is maintained between DT II and OT II, however, the actual conduct of the test is combined when cost effective. The purpose of DT/OT II is to validate the system's design integrity and operational suitability, including, training subsystems and logistic supportability. A complete integrated logistics support package and training package must be field tested and validated for

adequacy during OT II. Upon the successful completion of DT/OT II a system can progress into the production phase, however, if significant deficiencies are found in DT/OT II, design corrections are made and appropriate tests are repeated as DT/OT IIA. Systems are not permitted to enter into production on the basis that problems can be corrected and later verified using production hardware.

Satisfactory performance in the field is the number one priority in materiel development. Progression through the various developmental phases is largely dependent on the actual demonstration during development and operational tests, that all key criteria which have been established for the system can indeed be satisfied, including training requirements and logistic supportability.

Integrated Logistic Support (ILS)

We have already seen how technological advances in weapon systems over the last thirty years have had a tremendous impact on the modern battlefield in terms of lethality and mobility. These technological advances have had a significant impact on the logistic system as well. Weapon systems are often multimillion dollar items made up of several complex systems designed for maximum performance characteristics. The downtime of these complex weapon systems becomes increasingly more important as their costs increase. The cost of maintenance alone, entails a major expense. In fact, *the resource outlay for maintenance normally exceeds the initial acquisition cost of the system.* Therefore, economies in maintenance represent a substantial dollar savings and, more importantly, improvements in maintainability increase the operational availability of the system. However, in the past, during the developmental process, reliability and maintainability have frequently been sacrificed to attain the best operational characteristics. This can result in expensive, complex equipment spending more time undergoing repair and maintenance than being operational in the field.

	<u>WW II</u>	<u>TODAY</u>
TANK	\$70,000	\$600,000
FIGHTER		
AIRPLANE	\$50,000	11.5 MILLIONS
BOMBER	\$250,000	25 MILLIONS

ALL DECISIONS MADE DURING THE DEVELOPMENTAL PROCESS MUST CONSIDER THE LOGISTIC IMPLICATIONS OF THOSE DECISIONS.

ILS is designed to improve operational readiness and logistic support planning while minimizing operational and support costs. ILS has two primary goals: insuring that logistic considerations are integrated into the design effort of developmental and product-improved systems, and insuring that the materiel acquisition process includes the timely availability of all required logistic resources. *Under the ILS concept, the cost and adequacy of logistic support is a matter equal in importance to the cost and adequacy of the end item itself.* ILS requires that all decisions made during the conceptual, validation, and development phases of the materiel life cycle, take into account the logistic implications of those decisions. This procedure reduces the tendency to design and produce equipment without adequate recognition of the real and continuing logistic costs and constraints. Properly implemented, ILS produces a step-by-step development process which can be subjected to management appraisal and control techniques. Thus the fundamental concept of ILS is to relate logistic support to weapon system design in order to identify, validate, and document the logistic support required to maintain and operate the proposed weapon system as it is designed and, hence, to insure that when the weapon system is fielded, it can be supported. The principal considerations in ILS planning include:

- maintenance.
- support and test equipment.
- supply support.
- transportation and handling.
- technical data.
- facilities.
- personnel and training.
- support funds.
- management information.

HIGHLIGHTS

- The measure of effectiveness for logistic support is the percentage of weapon systems fully operable on the battlefield.
- The primary objectives of the logistician are to arm, fuel, and fix the weapon system, providing forward support to the combat force.
- The logistic support system has no other purpose than to support the weapon system.
- Throughout the logistic system, resources must be austere supplied, properly applied, and efficiently used.
- The life cycle management model is a step-by-step procedure for weapon system acquisition to include consideration of its overall logistic support system.
- In the development of weapon systems, the cost and adequacy of logistic support is a matter equal in importance to the cost and operational effectiveness of the weapon system itself.
- ILS is designed to improve operational readiness and logistic support planning while minimizing operational and support costs.

[illegible]

CHAPTER 2

LOGISTICS DESCRIBED

As indicated previously, the primary mission of logistics is to insure the operation of the weapon system on the battlefield. Logistics encompasses a broad spectrum of functions and responsibilities which are required in order that the ultimate objective might be achieved. In this chapter we will look beyond the battlefield and beyond the weapon system to the broader context of logistics as it is performed in today's Army. We will discuss what functions constitute logistics, where they are performed, and who has what responsibility in their performance.

**LOGISTIC
FUNCTIONS:**

SUPPLY
MAINTENANCE
TRANSPORTATION
SERVICES
FACILITIES

**LOGISTIC
ECHELONS:**

WHOLESALE
INTERMEDIATE
DIRECT SUPPORT /
USER



Logistic Functions

While the weapon system is a fundamental element of logistics and is the focal point for most of the logistic effort on the battlefield, the overall logistic system operates, for the most part, on a functional basis. AR 700-126 describes the *five major functional division of logistics* as:



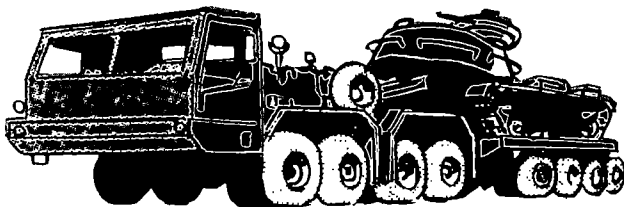
Supply - the procurement, distribution, maintenance while in storage, and salvage of supplies, including the determination of kind and quantity of supplies.

Maintenance - the function of sustaining materiel in an operational status; restoring it to a serviceable condition; or updating and upgrading its functional utility through modification.

Transportation - those services related to the movement of personnel and things to meet the Army's requirements and commitments.

Services - support functions such as food service, commissaries, laundries, dry cleaning, clothing sales stores, fumigation and bath, property disposal, and graves registration.

Facilities - real property programs and real property maintenance activities pertaining to the operation of utilities, maintenance of real property, minor construction, and other engineering support.



Echelons of Logistics

In addition to knowing what functions constitute logistics, it is also necessary to understand who performs what functions and where these functions are performed. As stated in AR 11-8, there are *three major echelons of logistic support* which are determined by the type of work done at each echelon. These are:

Wholesale Echelon - this includes the national inventory control points (NICPs), national maintenance points (NMPs), depots, terminals, arsenals, central wholesale data banks, plants and factories associated with commodity command activities, and special Army activities retained under direct control of DA HQ. Examples of organizations with wholesale responsibilities include: General Services Administration (GSA), Defense Logistics Agency (DLA), the Army Materiel Development and Readiness Command (DARCOM), Army Communications Command, Military Traffic Management Command (MTMC), and the Health Services Command. Their wholesale functions are generally performed in CONUS.

Intermediate Echelon - this support level provides the major interface between the wholesale and direct support/user echelons. It includes TOE and TDA units in the field which provide general support (GS) supply, maintenance, transportation, facilities, and services. Examples of organizations providing intermediate level logistics support include posts, camps, and stations in CONUS; the corps support command (COSCOM); theater army area command (TAACOM); transportation command (TRANSCOM); and engineer command (ENCOM); and their subordinate GS units.

Direct Support/User Echelon - this level includes TOE/TDA units in the field which provide direct support supply, maintenance, transportation, and services. Users include the combat, combat support, and combat service support units utilizing the services and equipment which are the responsibilities of the logistician.

Logistic Responsibilities.

HQDA.

The Deputy Chief of Staff for Logistics (DCSLOG) is the principal logistic advisor to the Chief of Staff. He has general staff responsibility for developing and supervising the Army logistic organization and system, including plans, policies, programs, doctrine, systems, procedures, and standards. Responsibilities of other staff officers having significant impact on Army logistics are:

Comptroller of the Army - cost analysis and fund control.

Deputy Chief of Staff for Operations and Plans - development of materiel and force requirements, establishing priorities for requirements, and user test and evaluation.

Deputy Chief of Staff for Research, Development, and Acquisition - materiel development, procurement, and production.

The Chief of Engineers - planning, directing, and supervising engineering, construction, and real estate services.

The Surgeon General - planning, directing, and supervising health services; formulating medical concepts and doctrine; developing estimates and plans for hospitalization and evacuation; medical materiel management; medical equipment maintenance; and optical fabrication.

The Assistant Chief of Staff for Intelligence - supply and maintenance support of certain items of equipment peculiar to Army intelligence units and activities which are not authorized by MTOE, TDA, or other authorization media.

Major Army Commands (CONUS)

The Army Materiel Development and Readiness Command (DARCOM) provides wholesale level supply and maintenance support for items of materiel used by the Army. Additionally, it develops and promulgates doctrine and provides schooling for these functions of the wholesale echelon of Army logistics.

Army Training and Doctrine Command (TRADOC) manages and provides individual training and schooling for Army-in-the-field subjects; formulates concepts, doctrine, organization, and materiel objectives and requirements for Army forces in CONUS and overseas; and develops and promulgates doctrine for the intermediate and direct support/user levels of logistics.

Army Forces Command (FORSCOM) commands all operational, divisional and strategic Army forces in CONUS, and as such, provides intermediate and direct support/user logistics to all assigned units and to those activities which are tenants of its installations.

More details on the organization and functions of major Army commands can be found in the following ARs:

AR 10-5	Dept of Army
AR 10-11	DARCOM
AR 10-13	Communications Cmd
AR 10-18	MTMC
AR 10-41	TRADOC
AR 10-42	FORSCOM
AR 10-43	Health Services Cmd
AR 10-122	Intell and Sec Cmd

Army Health Services Command is the single manager for all medical activities in CONUS.

Army Communications Command manages and controls materiel and facility resources acquired solely for the defense communications system (Army); provides intermediate and direct support/user level maintenance for electronic and communication equipment in the defense communication system; and provides GS/DS communication security logistic support in a theater of operations to Army component or unified command as required.

The Army Intelligence and Security Command and DARCOM determine requirements and DARCOM procures materiel for Army Intelligence and Security Command commodities.

The Military Traffic Management Command (Army) operates assigned military ocean terminals in CONUS and specified overseas terminals, and manages the DOD railcar fleet. It controls procurement of commercial transportation in CONUS and movement of cargo and passengers (Army sponsored) into air terminals and through ocean terminals. It also manages the DOD worldwide movement of personal property.

Non-Army Agencies

The General Services Administration (GSA) provides wholesale general supplies and services that are common to more than one department of the government. Examples include providing office supplies, operating administrative motor pools, and managing office buildings leased for government operations.

The Defense Logistics Agency (DLA) procures and distributes wholesale level common-type materiel used by the various military services. This includes the supply of subsistence, clothing, medical, electronics, petroleum, construction, industrial, and general supplies. In fact, more than half of the repair parts for the weapon systems of all military services are furnished by DLA. In addition, it provides contract administration services; stores, maintains, and issues industrial plant equipment that is excess to the needs of the military services; and administers the worldwide excess and surplus property disposal program for the Department of Defense.

Major Army Commands (Theater of Operations).

Logistics furnished in the theater of operations must be tailored to support the combat force requirements for each situation. Consideration must be given to the variety of missions which tend to make each logistic requirement different in terms of amounts and types of supplies, maintenance, transportation, and services needed. Consequently, the organizations discussed below cover the full spectrum of possibilities from a large theater of operations to that support required by a division-size unit.

FM 100-10, Combat Service Support, prescribes combat service support doctrine for use by commanders and staff officers at division and higher levels. It specifically addresses combat service support at theater army major functional and area commands and corps support command levels.

For further details on the operations of the theater army headquarters, see FM 54-7, Theater Army Logistics.

For further details on logistic operational doctrine, see the following:

FM 54-9, The Corps Support Command

FM 54-6, The Theater Army Area Command

FM 54-2, The Division Support Command

The theater army commander is responsible for providing logistic support to all Army units in the theater. He executes this responsibility through his staff, one or more subordinate theater army area commands, the corps, and such functional commands as he deems appropriate, i.e., personnel, transportation, medical, and engineer. He manages theater logistic support by establishing broad policies, allocating critical supplies, and assigning missions. Additionally, he manages and controls selected items through the theater army materiel management center (MMC).

The theater army area command (TAACOM) is a major logistic command and control headquarters in a theater of operations. During hostilities, the TAACOM provides direct and general supply and maintenance support to units in the communications zone to include non-corps units, joint elements, allied forces, and units passing through the communications zone. The TAACOM MMC manages the supply and maintenance support within the communications zone.

The corps support command (COSCOM) provides maintenance, supply, transportation, medical support, services, and other combat service support to an Army corps. Within the corps zone, nondivisional units receive direct and general supply and maintenance support from the COSCOM. Additionally, the COSCOM provides general support and backup direct support to divisional units. Its functional centers, the materiel management center (MMC) and the movement control center (MCC), perform the major tasks of managing the supply, maintenance, and transportation functions.

The division support command (DISCOM) provides direct support maintenance, supply, transportation, medical support, services, and other combat service support to an Army division.

HIGHLIGHTS

- AR 700-126 describes the five major functional divisions of logistics as: supply, maintenance, transportation, services, and facilities.
- According to AR 11-8 there are three echelons of logistics. They are: wholesale, intermediate, and direct support/user.
- The Deputy Chief of Staff for Logistics (DCSLOG) is the principal logistic advisor to the Chief of Staff.
- The Army Materiel Development and Readiness Command is the principal doctrine developer and operator for Army wholesale logistics.
- The Army Training and Doctrine Command is the principal trainer and doctrine developer for Army intermediate and direct support/user logistics.
- The Army Forces Command is the principal Army intermediate and direct support/user logistic operator in CONUS.
- The major Army commands overseas are the principal Army intermediate and direct support/user logistic operators outside CONUS.



CHAPTER 3

SUPPLY

As stated in Chapter 2, the supply function of logistics includes: the procurement, distribution, maintenance while in storage, and salvage of supplies, including the determination of kind and quantity of supplies. Basically, it is the **ARM IT** and **FUEL IT** of the logistic objectives. Supplies are the commodities necessary to equip, maintain, and operate a military force.

Classes of Supply

The Army divides supplies into general classes for planning and administrative purposes. These classes are:

Class I - Subsistence including gratuitous health and welfare items.

Class II - Clothing, individual equipment, tentage, tool sets and tool kits, hand-tools, administrative and housekeeping supplies and equipment. Includes items of equipment, other than principal items, prescribed in authorization/allowance tables and items of supply (not including repair parts).

Class III - POL: Petroleum fuels, lubricants, hydraulic and insulating oils, preservatives, liquid and compressed gases, chemical products, coolants, deicing and antifreeze compounds, together with components and additives of such products and coal.

FM 38-24, Classes of Supply, provides an amplification of classes and subclasses of supply prescribed in AR 11-8. Its purpose is to assist logistic staff officers and commanders at all levels by depicting current and potential uses of classes of supply as a means of improving logistic planning and operations.

Classes of supply are used extensively in the development of the logistic portion of operations plans (OPLANS). Supply operations are normally quoted in terms of "days of supply by class of supply" and logistic estimates are based on the same terms plus the term "pounds per man per day".

Supply distribution points are designated on maps by class and subclass of supply to provide location of supply units, e.g., classes IX-A and IX-L can be used to designate an aircraft and missile repair parts supply point. Hours of operation, levels of supply, methods and schedules of distribution, and any other pertinent information that may be useful to supported units can also be expressed using class and subclass of supply.

Class IV - Construction: Construction materials to include installed equipment and all fortification/barrier materials.

Class V - Ammunition: Ammunition of all types (including chemical, radiological and special weapons), bombs, explosives, and mines, fuses, detonators, pyrotechnics, missiles, rockets, propellents, and other associated items.

Class VI - Personal Demand Items (nonmilitary sales items).

Class VII - Major End Items: A final combination of end products which is ready for its intended use; (principal item) e.g., launchers, tanks, mobile machine shops, vehicles.

Class VIII - Medical material including medical peculiar repair parts.

Class IX - Repair parts and components to include kits, assemblies and subassemblies, reparable and nonreparable required for maintenance support of all equipment.

Class X - Materiel to support non-military programs; e.g., agriculture and economic development not included in classes I through IX.

Basic Supply Terminology

The figure below illustrates terms used in the planning and control of supply. The terms are defined or explained in the following paragraphs.

Level of Supply - A general supply term used for planning purposes and in the control of supply operations for expressing quantities of supplies or material authorized or directed to be held in anticipation of future demands. Levels may be expressed in days of supply or in quantity per item.

Operating Level of Supply - The quantities of materiel required to sustain operations in the interval between the arrival of successive shipments.

Safety Level of Supply - The quantity of materiel, in addition to the operating level of supply, required to be on hand to permit continuing operation in the event of minor interruption of normal replenishment or unpredictable fluctuation in demand.

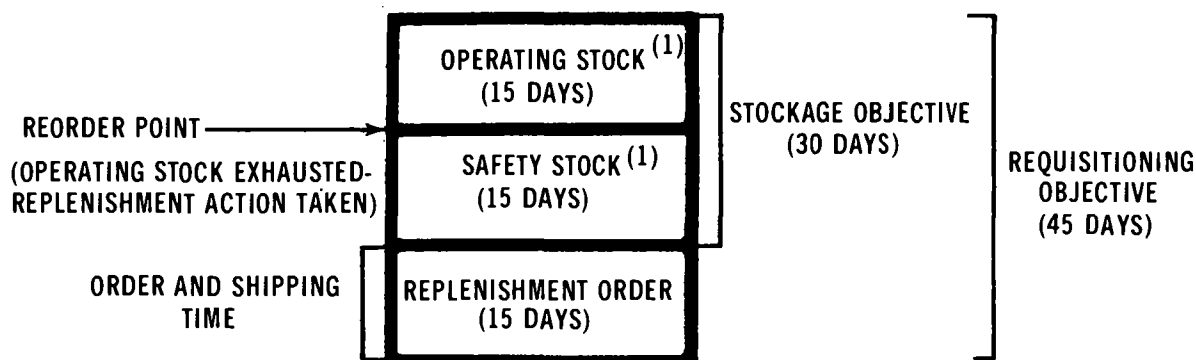
Order and Shipping Time - The time elapsing between the initiation of stock replenishment action (preparation of requisition) for a specific activity and the receipt and recording by that activity of the materiel ordered.

Procurement Lead Time - The interval between the initiation of procurement action and receipt into the supply system of the production model (excludes prototypes) purchased as the result of such actions. It is composed of two elements, production lead time and administrative lead time.

Requisitioning Objective - The maximum quantities of materiel to be maintained on hand and on order to sustain current operations. It will consist of the sum of stocks represented by the operating level, safety level, and the order and shipping time or procurement lead time, as appropriate.

Stockage Objective - The maximum quantities of materiel to be maintained on hand to sustain current operations. It consists of the sum of stocks represented by the operating level and the safety level.

Reorder Point - That point at which a stock replenishment requisition would be submitted to maintain the stockage objective. It consists of the sum of the safety level of supply plus the level for order and shipping time.



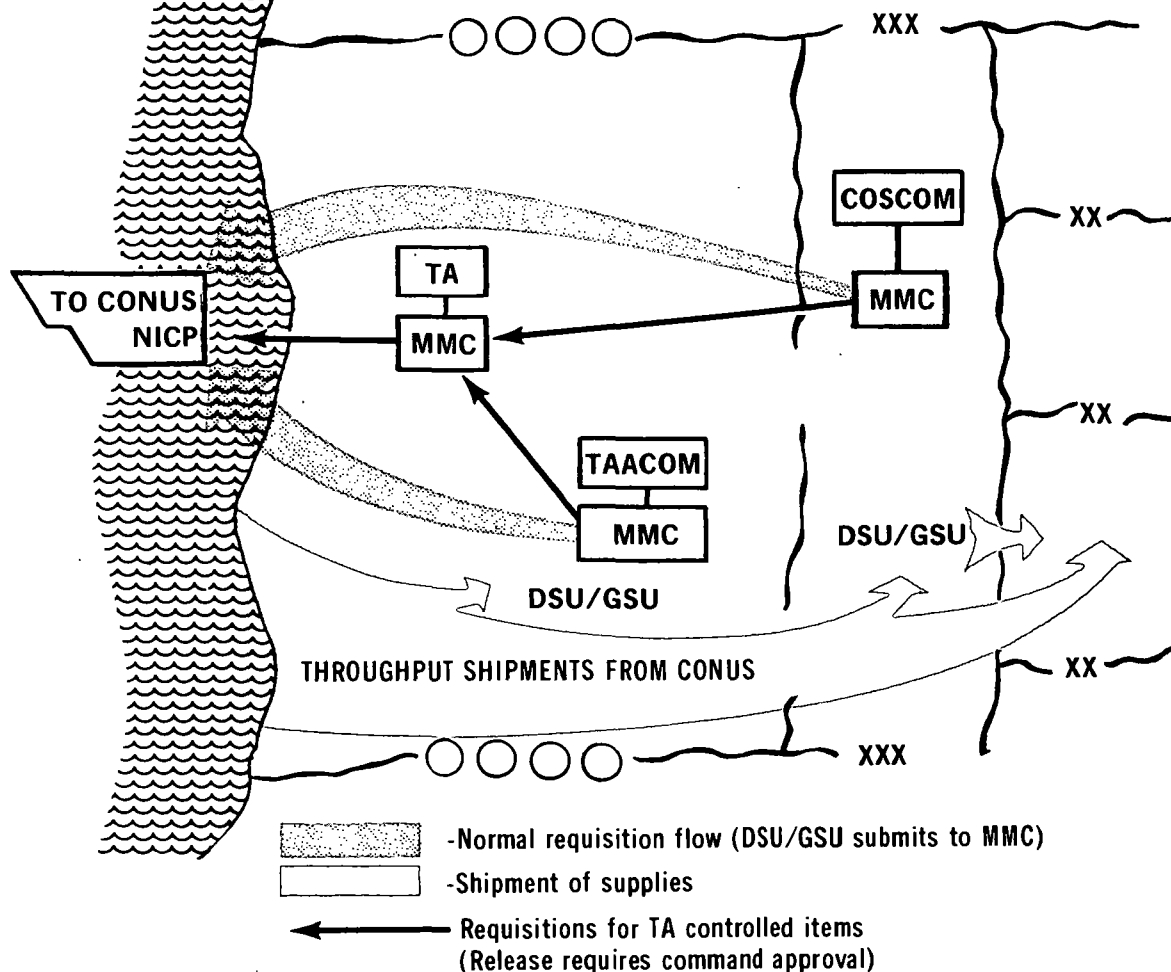
(1) "STOCK" AND "LEVEL" USED INTERCHANGEABLY

Note: Times indicated above are used for purposes of illustration only.

ILLUSTRATIVE USE OF BASIC SUPPLY TERMS

Supply Flow

The supply system provides for requisitioning, receiving, storing, transporting, and issuing supplies in their movement from manufacturer to user. The optimum system would perform these functions in as nearly a straight line as possible with a minimum number of stops.



Note: Requisitions for controlled items flow to TA MMC for appropriate action. This may entail priority shipment from CONUS, diversion of inbound shipment, search of other corps support commands in theater, or emergency shipment of item from TA controlled reserves in the theater.

REQUISITION AND SUPPLY FLOW

Depots in CONUS accept supplies from manufacturers, and some orient their outgoing shipments and support to particular areas of the world. For example, New Cumberland Army Depot, Pennsylvania, supports Europe. In some instances there are no depots at all, e.g., petroleum, which essentially moves from the supplier or manufacturer to the user. The national inventory control points (NICPs) direct shipments from these CONUS depots based on requisitions from units needing supplies. The depots' job is to receive, store, maintain, and issue stocks as directed by the NICP.

The amount of supplies stocked at any one location is based on the history of user demands and upon a forecast of demands based on operational plans or contingencies. In addition, amounts are stocked as a safety level to protect against stock depletion caused by unexpected demands from users or delays in delivery from suppliers. Special stocks are maintained in some overseas areas as a war reserve.

For overseas theaters, ordering and shipping times from CONUS become the major factors in determining the amount and location of supplies and supply units. For those items normally shipped by air, stockage might be less than for those shipped by sea. This is so primarily because the sea mode will provide larger quantities with each delivery but with longer waiting times between deliveries when compared to the air mode. Because of the longer waiting times between deliveries, storage of those supplies delivered by sea is necessary until the next delivery is made. POL, ammunition, combat rations,

FM 38-2, Logistic Inventory Management, provides comprehensive coverage of the six functions of inventory management performed at the NICPs in CONUS, i.e., cataloging, requirements planning, procurement direction, distribution direction, overhaul and rebuild direction, and materiel utilization and disposal.

DEPOTS RECEIVE, STORE, MAINTAIN, AND ISSUE STOCKS AS DIRECTED.

SUPPLY STOCKAGE IS BASED ON DEMAND HISTORY AND FORECASTED REQUIREMENTS.

seasonal clothing, selected major end items (tanks, artillery, etc.), and barrier material are some examples of items normally shipped by sea and held in reserve stocks stored in the theater. For those supplies delivered by air, such as repair parts, the rate of consumption tends to more closely match the rate of delivery and therefore reduces the requirement for large stocks of these items in the theater.

FM 29-10, Supply Management in a Theater of Operations covers principles, policies, guidance, and doctrine for staff officers and other personnel concerned with the centralized and automated management of supplies in the theater.

STOCKAGE AT DSUs IS AT A MINIMUM LEVEL TO MAINTAIN MOBILITY.

GSUs MAINTAIN BACKUP STOCKS FOR DSUs

FM 38-725-1, Direct Support System, provides doctrine, policy, procedures, and responsibilities for the direct support system.

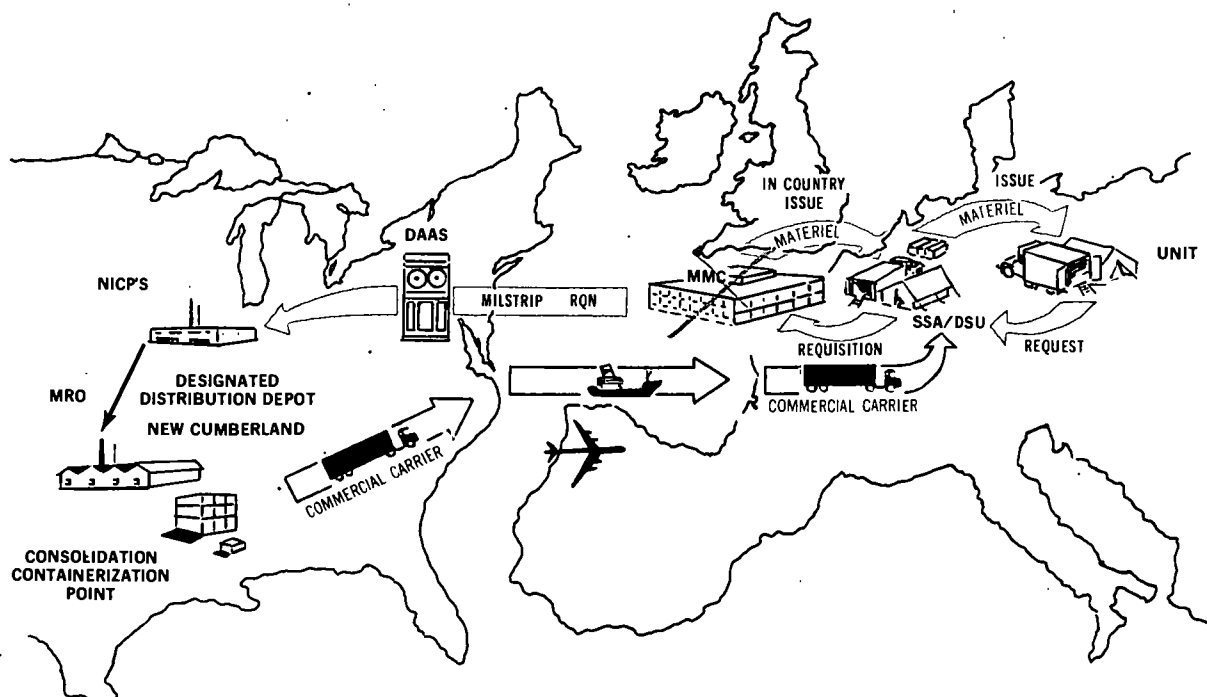
Each combat unit carries a basic load of ammunition and a prescribed load list (PLL) of supplies designed to sustain its operation for a limited time until it can be resupplied. Combat units of a division normally draw their supplies (excluding ammunition) from direct support units of the division support command, which in turn maintains stocks (authorized stockage lists-ASL) of items most essential to continued combat operations. These stocks are kept at a minimum level due to the need for maintaining mobility comparable to that of the supported combat unit. General support units of the corps support command maintain backup stocks for those direct support units they support and maintain additional items not stocked by the direct support unit. The theater army area command (in the communications zone) provides direct support and general support supply to units in the communications zone and also, in peacetime, stores stocks of war reserve and operational project stocks.

Since 1970, the Army has relied more and more on the direct support system (DSS) for supply support. The objectives of DSS are to take advantage of high-speed communications for requisitioning and reporting and more responsive means of transporting cargo. The system is characterized by maximum delivery of shipments direct from CONUS depots to direct and general support units bypassing and eliminating the need for supply depots in the theater. The system thus reduces oversea stock requirements and provides faster response to the requisitioner. In the combat zone, requisitions flow from the division materiel management center (DMMC) and nondivisional DS and GS units to the MMC of the corps support command. If available, the MMC will direct a GS unit to issue supplies to a DS unit. If not available, the requisitions go from the MMC to the appropriate CONUS NICP through the Defense Automatic Addressing System (DAAS). Requests from DS and GS units in

the communications zone are sent to the TAACOM MMC and then in a similar manner as above to the appropriate CONUS NICP. From there, materiel release orders are given to the CONUS depots to ship supplies to the units overseas. Depots process and ship full container and air pallet loads directly to the requisitioning DSU or GSU. Less than full container and air loads are shipped to the container consolidation points (Sharpe Army Depot for countries west of CONUS, and New Cumberland Army Depot for Europe) for consolidating, containerizing, and shipping to the DSU or GSU. The logistics control activity (LCA) in CONUS can monitor the responsiveness of the overall system, since it receives a copy of the requisition when it enters CONUS and is notified by the air and sea terminals when the supplies are loaded and on their way to the overseas area. The theater army MCC, in coordination with the

theater army MMC, monitors shipments enroute to support units. Intransit cargo can be diverted/reconsigned as necessary or movement expedited for direct delivery to forward elements. The corps commander can influence the flow of supplies to his units through the COSCOM MMC and MCC.

In wartime, because of the fluidity of tactical operations, throughput shipment will generally be routed to GSUs for subsequent forwarding to DSUs. This allows the DSUs to have the mobility required to keep up with the combat units they support and allows the COSCOM commander the ability to influence the flow of supplies to the units with the most urgent requirements. Further, this will ensure single asset visibility of supplies at the COSCOM level (i.e. general support level) when the supplies are initially introduced into the corps area.

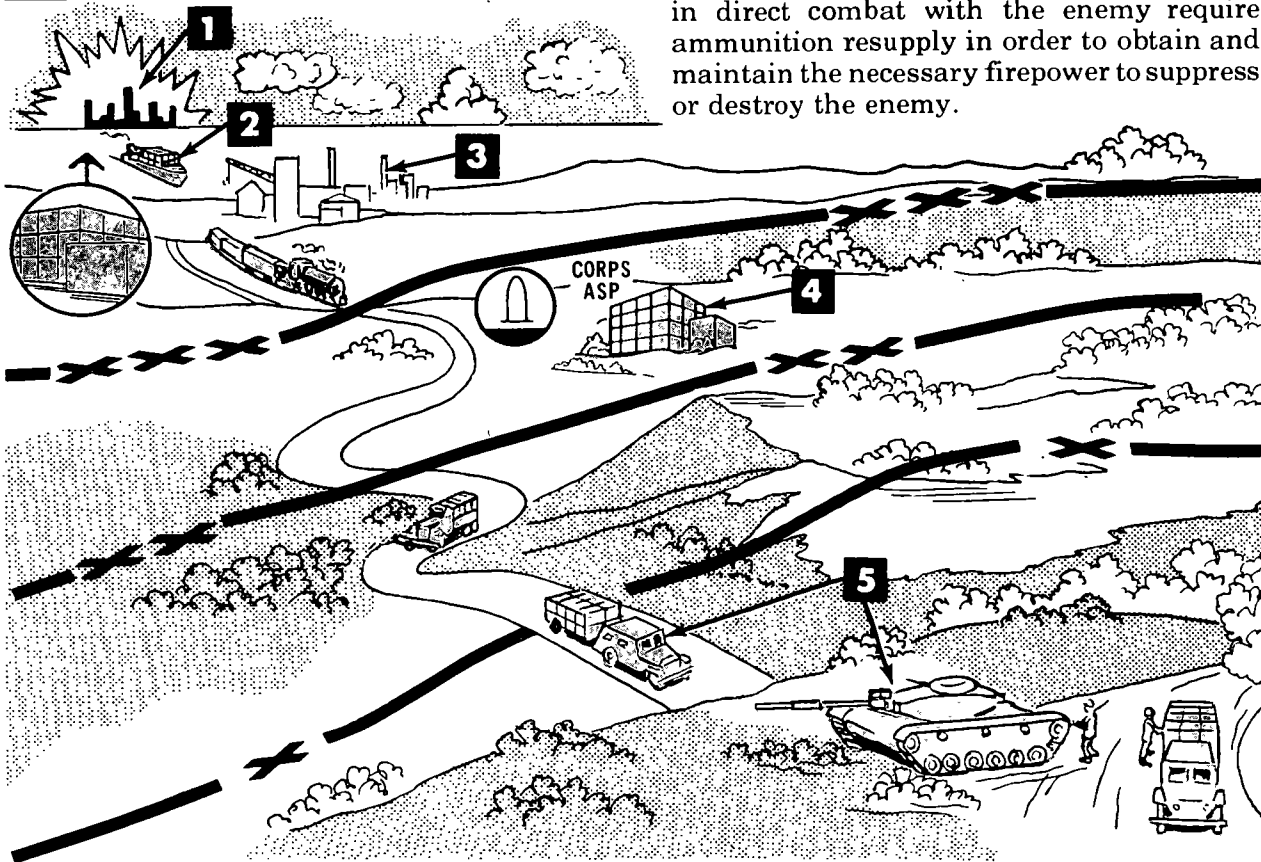


FM 9-6, Ammunition Service in the Theater of Operations provides doctrine for the management of ammunition supply and maintenance and discusses generally the organization and operation of conventional and special ammunition elements.

Ammunition Supply

Arming the Weapon System

One of the most critical elements in the supply function is the supply of ammunition. This has a direct effect on the conduct of operations on the battlefield. Those elements in direct combat with the enemy require ammunition resupply in order to obtain and maintain the necessary firepower to suppress or destroy the enemy.



(1) Ammunition is packed on pallets or in containers at the CONUS depot or outloading port.

(2) It is shipped via containership or break-bulk transport.

(3) On arriving in the theater, ammunition is then moved through fixed ports or over the shore utilizing materials handling equipment designed specifically for the type of packaging, terrain, and climatic conditions. In fact, throughout the ammunition supply process the required materials handling equipment must be available to handle, move and off-load the items once they reach their destination.

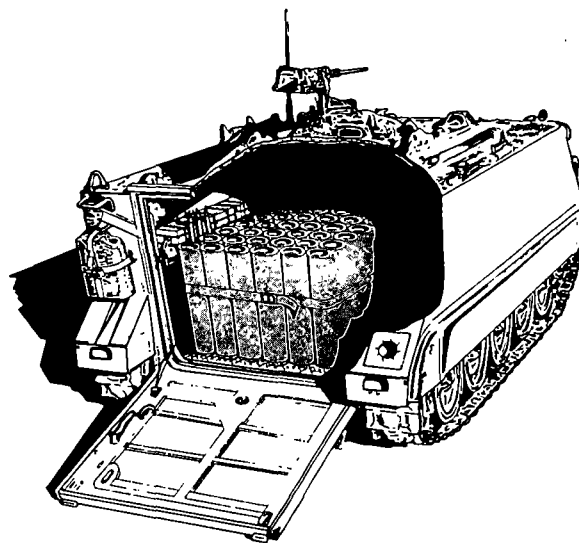
(4) Once through the port or over the shore, the ammunition flows in a rapid steady flow

to corps level ammunition supply points (ASPs) which are established as far forward as practicable. Conditions permitting, corps ASPs may be located in division areas. The corps receives, stores, and issues ammunition.

(5) The fighting elements draw ammunition from the ASPs to replenish their basic loads and meet operational requirements. They send tactical wheeled vehicles back to the ASPs to pick up the ammunition and deliver it to the forward areas. In some cases it may be necessary to transfer the ammunition to armored resupply vehicles at battalion combat trains in order to get the ammunition to armor and mechanized infantry units in the main battle area.

Units are authorized basic loads of ammunition which enable them to fight the battle until they are resupplied. In order to sustain tactical operations for specific periods, units indicate their ammunition needs by submitting required supply rates (RSR) for specific types of ammunition to their next higher tactical headquarters. Due to rapidly changing tactical situations and problems which may arise in the ammunition distribution system, the actual supply rate may be less than that required. To accommodate these variables, each tactical commander, from the highest level on down to battalion, announces a controlled supply rate (CSR) to his next subordinate commander in order to control ammunition consumption to best meet mission requirements in light of the available supply.

The preceding paragraphs deal with ammunition supply primarily as it relates to conventional ammunition. The handling of special ammunition requires more stringent controls. Special ammunition is that which requires extraordinary control, handling, or security such as nuclear and nonnuclear warhead sections; atomic demolition munitions; nuclear projectiles; and missile bodies, related components, and propellants. Logistical procedures used with special ammunition require - command decisions and tight security measures for all phases of operations involving special ammunition; rigid technical maintenance requirements; and vigorous safety programs and practices.



*ARMORED FORWARD REARM VEHICLE
(AFARV) SAMPLE CONFIGURATION*

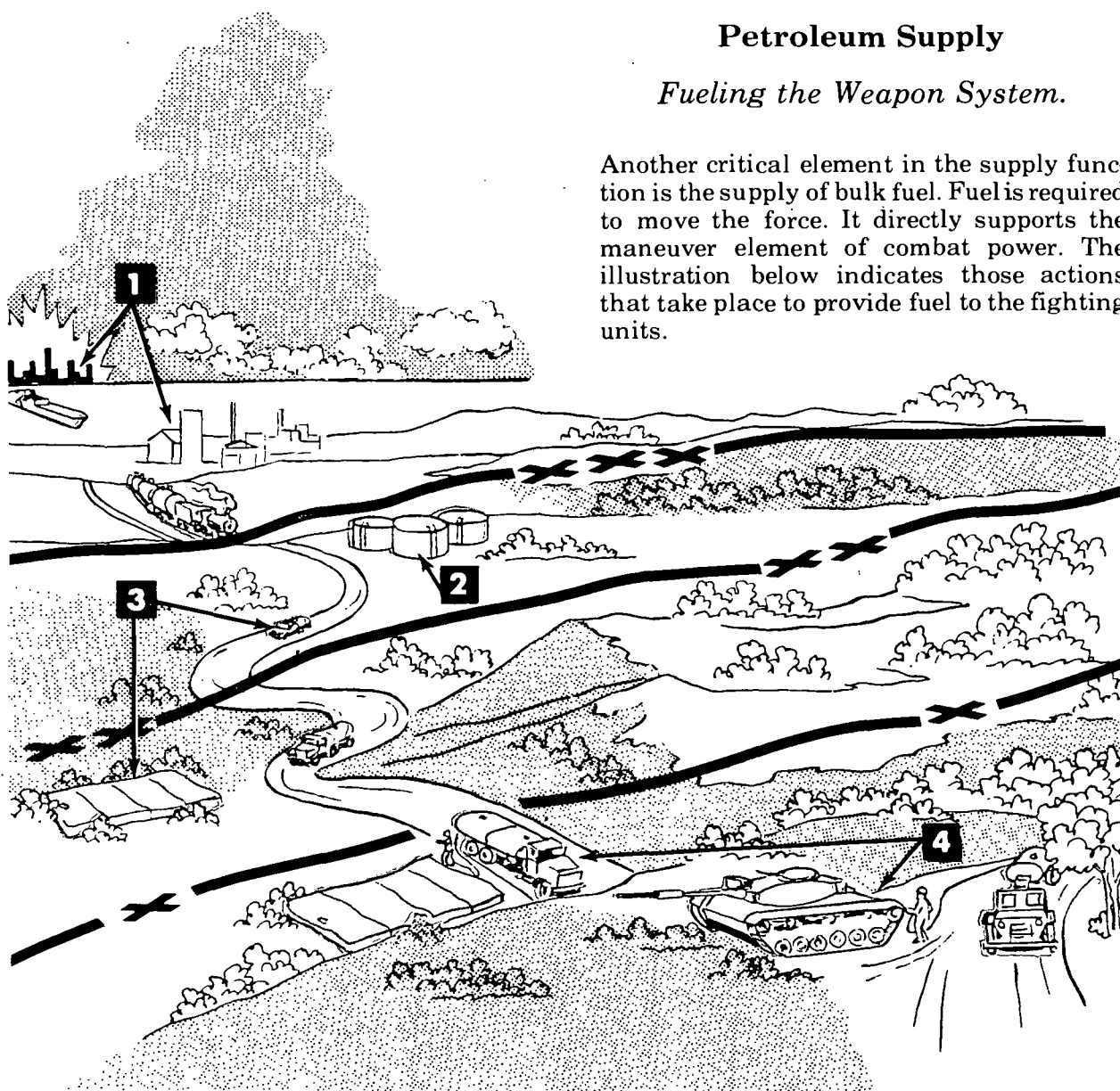
FM 9-38, Conventional Ammunition Unit Operations, provides guidance on the operations, techniques, and procedures utilized by conventional ammunition units in providing conventional ammunition service support in the theater of operations.

FM 9-47, Special Ammunition Unit Operations, presents unit operational techniques and procedures for special ammunition service support in the theater of operations.

Petroleum Supply

Fueling the Weapon System.

Another critical element in the supply function is the supply of bulk fuel. Fuel is required to move the force. It directly supports the maneuver element of combat power. The illustration below indicates those actions that take place to provide fuel to the fighting units.



(1) Bulk fuel essentially moves from off-shore suppliers (CONUS or oversea sources) to the theater.

(2) It flows into corps field storage (bladders or tank farms) via pipelines, trucks, railcars, and, in an emergency, aircraft delivery. Indigenous vehicles and other modes of transportation are used whenever practicable.

(3) The corps moves the fuel to the divisions. There the fuel is stored in bladders or on tank trucks. Unlike ammunition, the division does have an organic capability to receive, store, and distribute bulk fuel.

(4) The division delivers to its brigades and other major units. Tactical refueling forward of brigade trains is by battalion tankers.

Bulk fuel supply, like ammunition, is based on gross forecasts of fairly predictable requirements. It is a continuous supply system which is accelerated or decelerated as the dynamics of the combat situation dictate. Lower echelons submit their requirements through supply channels. The Joint Petroleum Office (JPO) consolidates theater requirements and submits the consolidated bulk petroleum slate to source agencies such

as the Defense Fuel Supply Center of DLA for procurement. The JPO advises the major commands on petroleum policy, planning, and the allocation of products and facilities. Centralized control of bulk POL distribution within the corps is at corps level where automatic resupply procedures are monitored and allocations to subordinate elements are based on the availability of fuel and the tactical situation.

HIGHLIGHTS

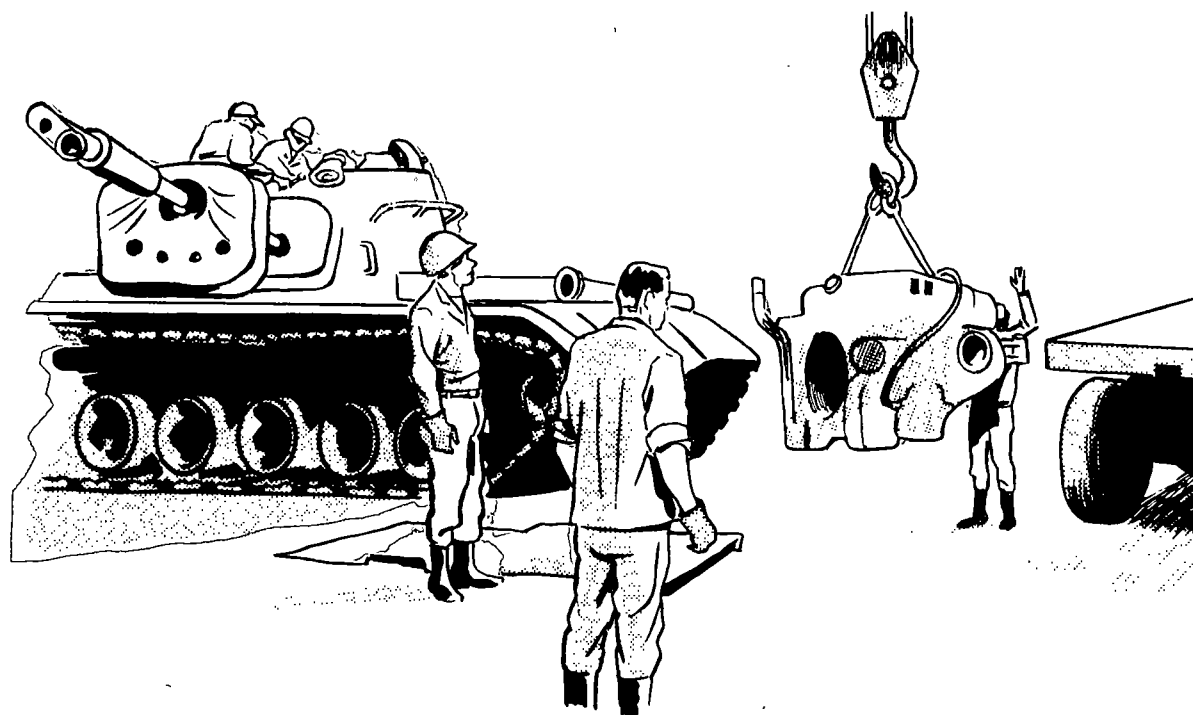
- The Army divides supplies into ten general classes for planning and administrative purposes.
- Ammunition supply = Arming the weapon system.
- Ammunition supply directly affects firepower.
- Petroleum supply = Fueling the weapon system.
- Petroleum supply directly affects maneuver.
- Depots in CONUS receive items from the manufacturer and store, maintain, and issue stocks to requesting units on direction by the appropriate NICP.
- The amount of supplies stocked at any one location is based on user demands, ordering and shipping times required for replenishment, and mobility requirements.



CHAPTER 4

MAINTENANCE

In Chapter 2 maintenance was defined as the function of sustaining materiel in an operational status; restoring it to a serviceable condition; or updating and upgrading its functional utility through modification. In short, it is the **FIX IT** of the logistic objectives. Since the probability of rapid replacement of major items of equipment early in the conflict is remote, *we will have to fight with what we have*. The equipment that we enter the conflict with must be kept operable for as long as possible. The magnitude of this effort can be more easily understood when one realizes that 80 to 90 percent of items in the supply system are repair parts. The job is further complicated by the variety of equipment supported and the conditions under which the maintenance system must operate on the modern battlefield. The thrust of maintenance in this environment is forward in order to maximize the combat time of equipment by minimizing repair and evacuation time.



BATTLEFIELD REPAIR

Army Wholesale Materiel Maintenance

The wholesale materiel maintenance activities of the Army include:

Performing maintenance engineering to include the development, documentation, and timely deployment of a system for the support of new or modified supportable end items and weapon systems. Maintenance engineering determines where, when, how, why, and by whom those actions necessary to maintain equipment or restore it to a serviceable condition will be taken. As defined in DOD Directive 415.12, maintenance engineering is that activity of equipment maintenance which develops concepts, criteria, and technical requirements during the conceptual and acquisition phases of materiel development to be applied and maintained in a current status during the operational phase in order to insure timely, adequate, and economical maintenance support of weapons and equipment.

Discharging other assigned materiel maintenance and maintenance related supply responsibilities by national level materiel managers as outlined in AR 750-1. National maintenance points (NMPs) are established by national level materiel managers to perform maintenance engineering and other assigned wholesale maintenance tasks for assigned weapons systems and classes of supply. These NMPs are assisted by research and development activities, NICPs, national level data banks and other specialized agencies, and by the producers of the systems or equipment used by the Army and other commercial firms under contractual arrangements.

FM 38-5, Maintenance Management, addresses the basic principles, policies, responsibilities, organizations, and operational relationships pertinent to Army Maintenance Management as it applies to wholesale logistics.

Conducting depot maintenance operations. Depot maintenance is normally performed only by DARCOM depots in CONUS. Such operations support the overall DA inventory management program. They are used as an alternative or supplement to new procurement and as a source of serviceable assets to meet DA materiel requirements. Programs for the depot maintenance of materiel, except those for the repair and return to Reserve component users of equipment, are approved by HQDA and controlled by national level materiel managers under the monitorship of the Deputy Chief of Staff for Logistics (DCSLOG), DA. The Reserve components repair and return-to-user depot maintenance program is controlled by Forces Command (FORSCOM) and coordinated with DCSLOG, DA. Approved depot maintenance programs are executed by designated Army arsenals and depot maintenance facilities; by agreement with other military services; and by contractual arrangement with commercial firms. Such repair programs are planned and scheduled based on the needs of the supply system and the direct exchange (DX) program, and in accordance with the availability of the required repair parts and other maintenance resources.

Army-in-the-Field Materiel Maintenance

Army-in-the-field maintenance activities sustain the operational effectiveness of the force. They operate in accordance with the plans and equipment publications prepared by the NMPs. They are concerned with the conduct and management of the organization and support categories of materiel maintenance.

FM 29-20, Maintenance Management in the Theater of Operations, and FMs 29-2, 29-23, and 29-24 provide further details on maintenance operational doctrine for the Army in the field.

Organizational maintenance - each combat, combat support, and combat service support activity is authorized an organic materiel maintenance capability (operator/crew and maintenance personnel) to perform organizational maintenance operations.

Direct support maintenance operations support the using unit. These operations are performed on equipment in the DS unit area or when practical and more effective, at the site of the equipment failure through the use of highly mobile maintenance support teams. DS maintenance units provide backup for organizational maintenance and serve as the supply system outlet for repair parts required by using units. They also maintain operational readiness float stocks and serve as the primary reentry point for unserviceable repairable equipment to the supply system. Evacuation or disposition instructions for items which are not economically repairable at the DS level are provided by the appropriate MMC:

General support maintenance operations are primarily aimed at the repair of end items or modules for return to the supply system. General support maintenance also provides backup direct support maintenance. Items evacuated from DS maintenance units generally constitute the workload of GS maintenance units. The emerging GS structure, currently undergoing evaluation, consists of integrated technical centers providing supply and maintenance support. These centers are tailored to support the force. Their size, types, numbers, and location depend on the equipment density, intensity of combat, and the geographic environment. Each center provides general support maintenance, repair parts supply, and end item supply for a group of weapons system or materiel items. They assist forward support units on technical problems and in battlefield recovery and damage assessment, operate collection points for battlefield recovered items, and manage their use as a cannibalization source for repair parts and assemblies.

Presently, it is envisioned that general support centers will be established for the following categories of materiel:

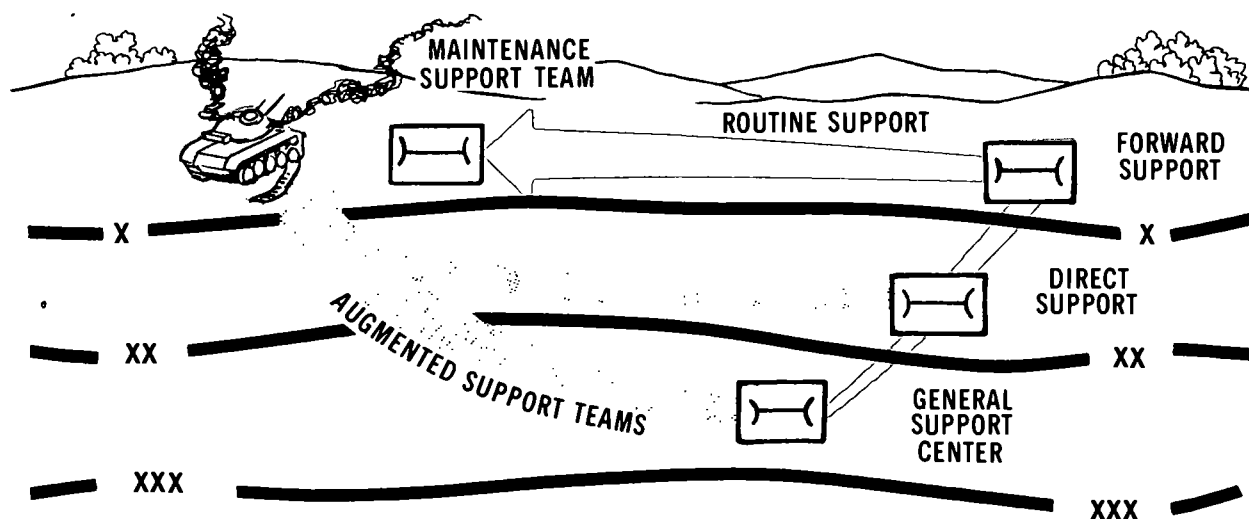
- Armament and combat vehicle
- Wheel vehicle
- Aviation
- Missile
- Communication-electronics
- Ground support equipment

To tailor the general support structure austere, two or more centers may be combined or, on the other hand, optimum support may be achieved by having more than one center of a particular type.

When established, the centers normally provide the highest level of technical competence on weapon systems in the theater. Each center works directly with CONUS logistic centers and readiness commands of the US Army Materiel Development and Readiness Command (DARCOM) from whom they draw technical expertise and support. DARCOM technical specialists and representatives from industry may be called upon to provide on-site assistance on weapon systems technical problems.

Support Forward

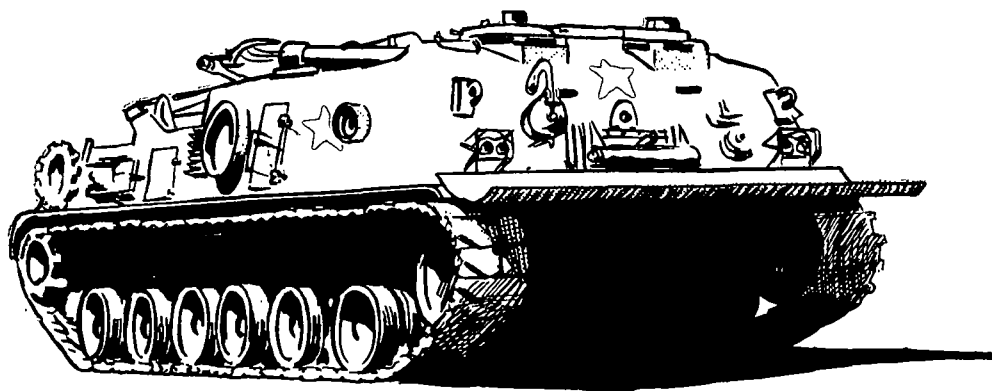
As was the case with the ARM IT and FUEL IT aspects of the supply function, the concept for maintenance support or FIX IT is based on forward support of combat units and weapon systems. When equipment requires repair, maintenance personnel organic to the combat units arrive on the scene first. Forward support maintenance companies extend their support to combat units by sending maintenance support teams to work with them. Normally, about half of the repairmen in these companies will be operating in the combat units area. The teams are augmented as needed by additional teams from division rear or by technical assistance from corps general support. People, parts, and tools are pushed into the forward support area as required and pulled back when no longer needed. Due to the nature of the modern battlefield, the performance of maintenance in the forward areas will often require a hardened vehicle to transport the repairmen, repair parts, and necessary test equipment. Such a mobile repair vehicle should have a lifting capability to facilitate the removal and replacement of major components.



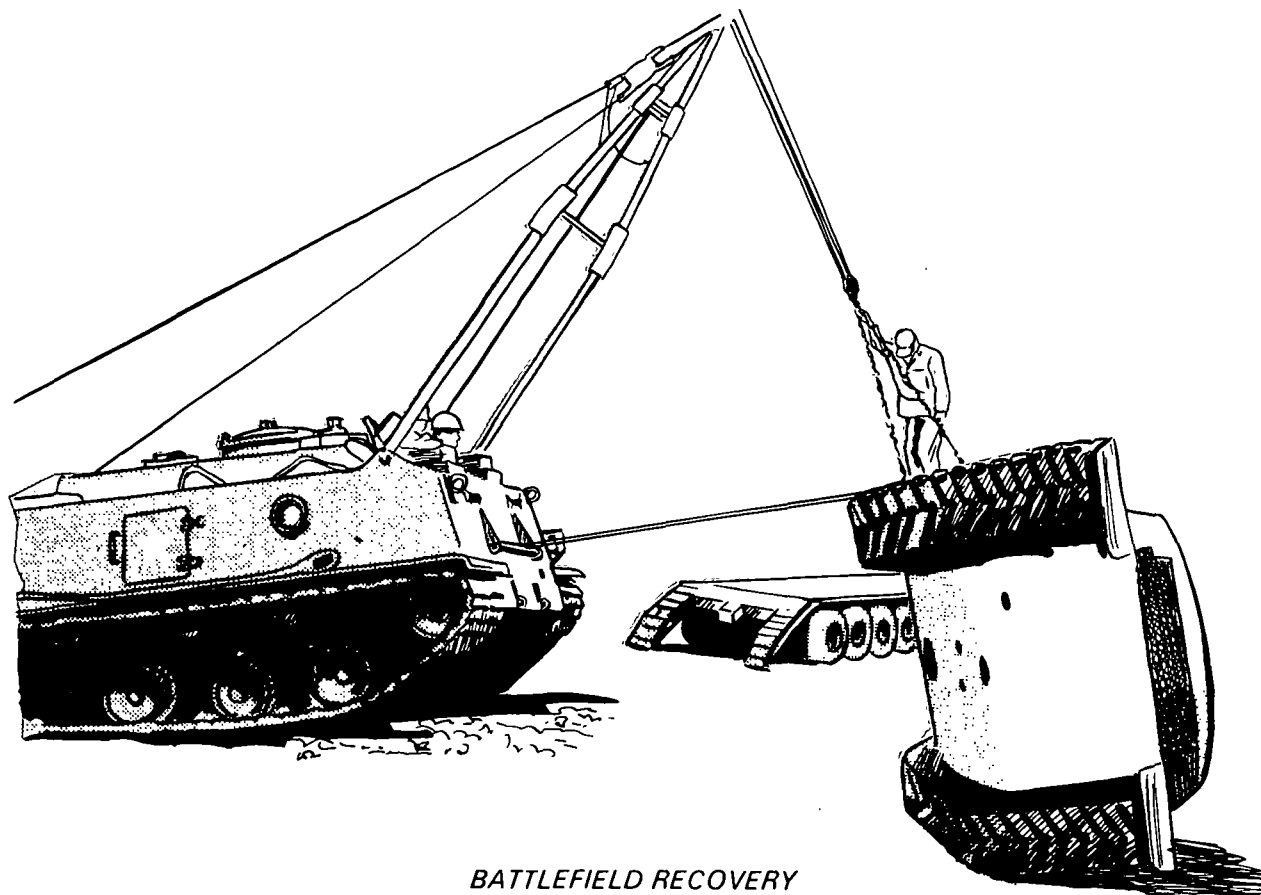
SUPPORT FORWARD

Another aspect of maintenance support forward is battlefield recovery and cannibalization. If the weapon system cannot be repaired in the forward area, it must be recovered and repaired in rear areas. Again, emphasis is on the requirement to utilize that equipment that we have because replacement may not be possible. Battlefield recovery requires the use of heavy equipment recovery

vehicles to get the damaged equipment to a location where it can be loaded on heavy equipment transporters and evacuated from the battle area. Also, supervised battlefield cannibalization may be used when parts are not available from the supply system and an item of equipment can be repaired using parts from other unserviceable equipment.



HARDENED VEHICLE



BATTLEFIELD RECOVERY

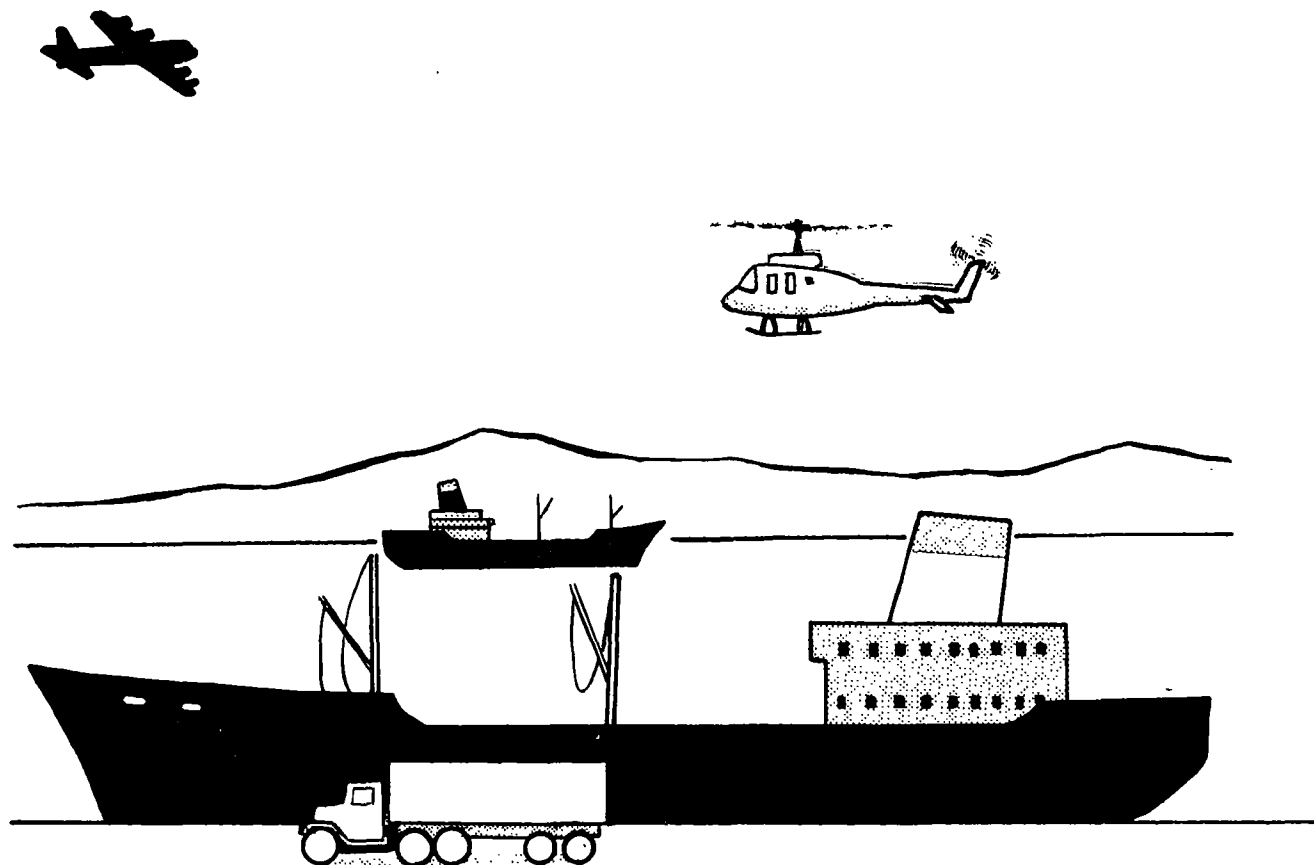
HIGHLIGHTS

- Maintenance = Fix the weapon system.
- Wholesale maintenance functions include: maintenance engineering, operation of national maintenance points, and depot maintenance operations.
- Army-in-the-field maintenance sustains the operational effectiveness of the force. General categories include: organizational, direct support, and general support levels of operation.
- Maintenance operations must be conducted as far forward as practicable, and their elements must be redeployed when not required.
- We must use the equipment we have because timely replacement may not be possible.

CHAPTER 5

TRANSPORTATION

Transportation is described in Chapter 2 as those services related to the movement of personnel and things to meet the Army's requirements and commitments. It is the common thread that runs through all of the functions of logistics. Without adequate transportation, successful accomplishment of the ARM IT, FUEL IT, and FIX IT objectives of logistics would be impossible. This is especially true considering the support forward concept of logistic operations.



Airlift and Sealift Services

The Military Airlift Command (MAC) and Military Sealift Command (MSC) provide transportation service from CONUS to the theater for all elements of DOD through a combination of organic means and commercial augmentation. MAC is also responsible for providing tactical airlift service within the theater as well. Each military department provides requirements for airlift and sealift for planning purposes, and also provides funds to reimburse MAC and MSC for services provided. The lift requirements also include those intratheater and intertheater movements generated by commanders of unified and specified commands to support training exercises and contingency operations.

After receiving the airlift and sealift requirements from the military departments, MAC and MSC compare capabilities with requirements, allocate space assignments, and prepare operating schedules to satisfy the overall movement program. In the event that requirements exceed capability, the joint transportation board of the Office of the Joint Chiefs of Staff, chaired by the J4, determines the allocation among the services.

The Military Traffic Management Command (MTMC) controls movement of DOD cargo and Army personnel into the MAC air terminals, while MAC operates the terminals and loads and unloads the aircraft. For DOD cargo moving by ocean, MTMC controls movement to and through ocean terminals, loads and unloads ships at military terminals, and arranges for terminal services through commercial facilities, as required.

Transportation Service in the Theater

In the theater of operations, transportation units of theater, corps, and division provide services in three functional areas.

- Transportation movement management (excluding POL by pipeline).
- Transportation mode operations (air, motor, rail, and water transport).
- Terminal operations.

At theater army level the transportation command (TRANSCOM) provides theater-wide transportation services and is the principal Army transportation headquarters in the theater. The TRANSCOM has units assigned to perform the functions of terminal services, water transport, motor transport, aviation support, and rail transport. The number, size, and type units assigned are dependent on the force supported, geographical location, movement requirements in terms of people and cargo, and numerous other factors.

At corps level, transportation units are assigned to provide mode operations depending on the requirement. In an independent corps operation, units to operate terminals and provide surface and air transportation service will be assigned as necessary. All units are assigned to a controlling headquarters, i.e., a transportation brigade or group, which in turn is assigned to the corps support command.

At division level, a transportation motor transport company is assigned to the supply and transport battalion of the division support command. This company provides a minimum capability for moving bulk POL and general cargo and from time to time is augmented by motor transport from the COSCOM, particularly when the supply and transport battalion, division main, or other headquarters must be displaced rapidly in one lift.

FM 55-1, Army Transportation Services in a Theater of Operations provides doctrinal guidance on transportation operations in the theater. Its purpose is to assist transportation staff officers at all levels in the performance of their duties.

Transportation Movement Management

Movement control is centralized at the highest organizational level in order to maintain flexibility of support and obtain maximum efficiency and effectiveness. The theater army movement control center (MCC) performs this function at theater army level. It prepares movement and port clearance plans and programs, supervises the activities of the field transportation movement offices, regulates the use of highways, and insures that the available movement capability is fully utilized. The MCC, in coordination with the theater army materiel management center, establishes distribution patterns so that the resources of both the GSUs and the transportation system can be best utilized. In determining these distribution patterns, consideration is given to the capabilities of the consignor and consignee to ship and receive by various modes, their total capability, their respective geographical locations, and their locations with respect to the available transportation system. The MCC assigned to the COSCOM is concerned with

coordinating throughput shipments from CONUS, movement within the corps rear area, and shipments going forward to the divisions. The COSCOM MCC operations are tied in with the theater army MCC to insure maximum effectiveness. Highway traffic regulation in corps becomes a critical function due to the increased tactical as well as administrative movements on a typically more restrictive road network, and in a situation involving greater rear area security activity.

FM 55-10, Army Movement Management Units and Procedures, shows why and how the use of transportation resources are managed and controlled in an overseas theater and explains the duties of personnel assigned to a movement control unit or activity. It provides a general guide for commanders and staff officers at all levels for organizing and operating the transportation movement system in a theater of operations.

Intransit Asset Visibility

**THE LOGISTIC MANAGER
NEEDS TO KNOW THE LOCATION
OF HIS ASSETS IN THE LOGISTIC
PIPELINE AND BE ABLE TO
REDIRECT THEIR MOVEMENT**

**EFFORTS ARE UNDERWAY TO
PROVIDE THE LOGISTIC
MANAGER A COMPLETE OVER-
VIEW OF THE LOGISTIC PIPELINE
AND THE CAPABILITY TO IN-
FLUENCE THE FLOW OF ASSETS**

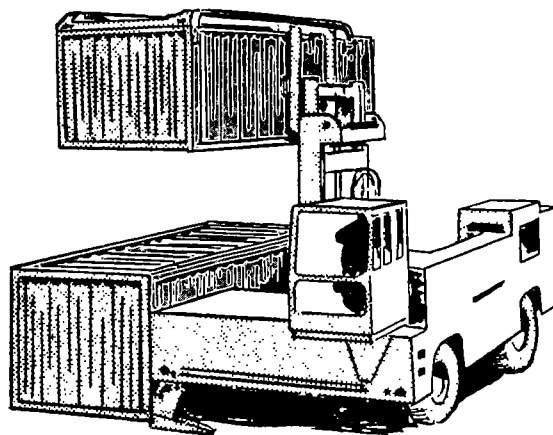
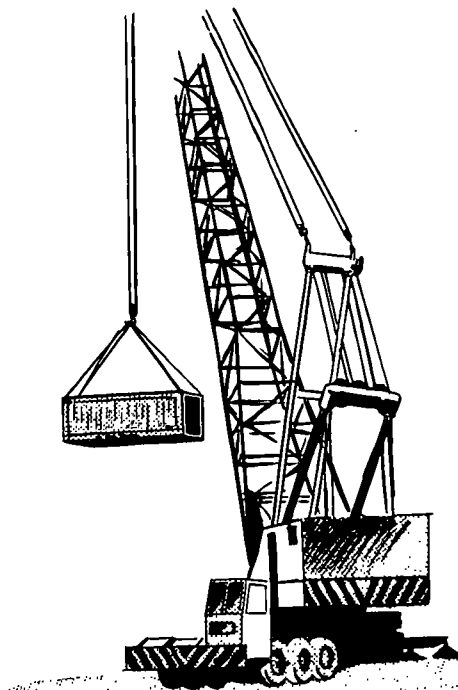
A vital element necessary for the effective accomplishment of the logistic mission is the capability of supply and transportation managers to know where assets are in the logistic pipeline and to be able to redirect their movement. The Logistics Intelligence File (LIF) maintained by the US Army Logistics Control Agency at the Presidio of San Francisco, California, gives managers visibility of selected items from the initial CONUS shipping point to theater organizations. There remain, however, a number of voids which prevent total visibility of the logistic pipeline, for example, the lack of visibility of shipments not originating in CONUS, the lack of visibility of non-Army sponsored cargo, and the lack of visibility of in-theater intransit cargo on a checkpoint basis. In Europe, attempts to fill these voids have resulted in a theater data bank called FINDER, now under development, to be linked to materiel management centers and other theater supply management activities throughout the theater. Access to the Visibility of Intransit Cargo (VIC) System, a transportation information system under development which will be linked to movement control centers and other movement management activities throughout the theater, will allow the theater data bank to provide managers with the current status of in-theater intransit supplies. Together, using high-speed communication and ADP techniques, the LIF, the theater data bank, and the VIC can effectively interface supply and transportation documentation to provide managers in CONUS and in the theater a valuable source of supply and transportation performance data and a complete overview of the logistic pipeline.

Containerization

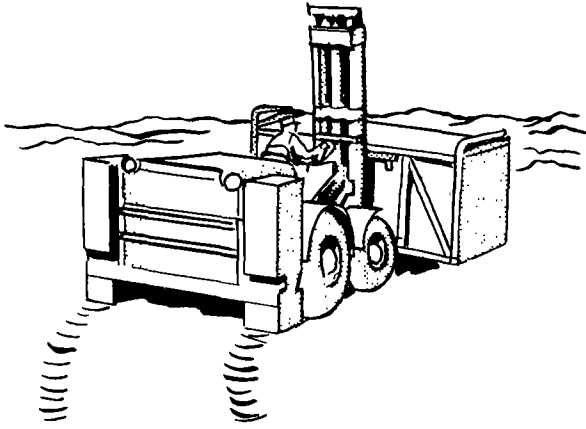
Within the transportation industry, there has been a phenomenal growth in the use of containers for transporting cargo, especially since the 1960's. Basically, containerization has grown within the transportation industry because it is cheaper, faster, and more efficient than shipping by the break-bulk method. Rail and highway transport operators are placing more emphasis on containerization each year. The ultimate goal of the transportation industry is the incorporation of containerization into an inter-modal transportation system.

The container revolution has had a tremendous effect on the military services. Since containerization offers the same advantages to the military services as it does to commercial firms, and since the military services are highly dependent on commercial firms for transportation services, the military must develop techniques and equipment which will allow them to maximize these benefits.

At the present time, the military does not have a sufficient fleet of containers and container-related equipment to support DOD container requirements. In fact, it is not envisioned that the military will, in the foreseeable future, purchase enough containers to satisfy DOD requirements as long as commercial container service is available through contract or by leasing. Although this is satisfactory for peacetime, supporting combat forces in wartime will necessitate a greater military containerization capability. Existing commercial port handling facilities may be destroyed or inoperable. Containers

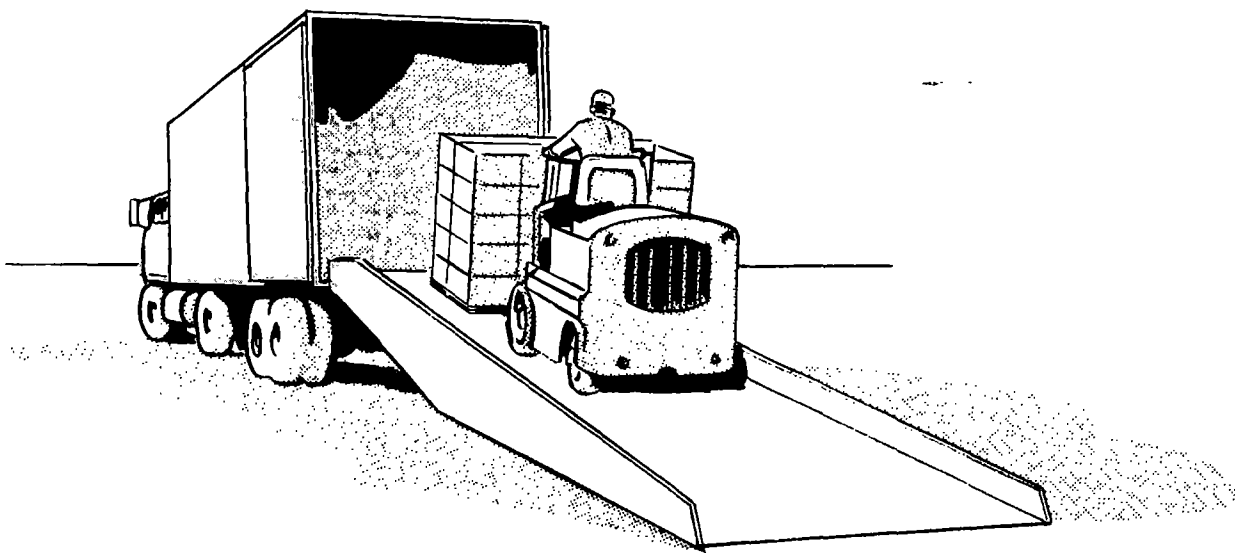


FM 55-70, Army Transportation Container Operations, provides doctrinal guidance to personnel engaged in transportation container operations and covers all phases of military and commercial container transport operations by all transport modes.



may be required to be moved over the beach for lack of port facilities. The tactical mobility required by combat units cannot be provided by commercial operators. In order to ensure an adequate container handling capability the military must either adopt commercial equipment, as is; modify commercial equipment for military use; or develop equipment to satisfy problems unique to the military, i.e., over the beach and rough terrain operations.

A significant key to attaining the mobility required on the modern battlefield is the acquisition of container handling and transport equipment. The Army requires the cranes, forklift trucks, and line-haul capability to handle containers. This requirement exists from the wholesale operation in CON-US down to the rough terrain forklift required to empty containers at the ultimate receiving point in the theater. The Army is moving ahead in attempting to satisfy these requirements. The approval of the Army-in-the-Field Container System Study by TRADOC and HQDA has given added impetus to efforts to obtain the required container-related materials handling equipment. For a significant number of items, the acquisition process is well advanced and equipment should be in the hands of using units during fiscal year 1977.



CHAPTER 6

SERVICES AND FACILITIES

The services and facilities functions of logistics, though just as important, have a less direct impact on combat effectiveness, i.e., maneuver and firepower, than do the functions of supply, maintenance, and transportation. This is especially true as they relate to weapon system support. However, inadequate performance of the services and facilities functions of logistics would soon be felt by the combat force. This chapter will briefly discuss these functions and their effect on accomplishment of the logistic mission.

Services

The services function of logistics is described in Chapter 2 as consisting of support functions such as food service, commissaries, laundries, dry cleaning, clothing sales stores, fumigation and bath, property disposal, and graves registration. The following paragraphs provide further information about some of these activities.

The Army Food Program—

This program includes all activities necessary to insure that all persons are properly fed. It involves research and development, procurement, inspection, storage, distribution, preparation, service, and conservation of food. The program stresses the responsibility of commanders for its implementation and execution since nutritionally adequate, appetizing, and acceptable diets have a direct effect on the morale, well-being, and combat efficiency of military personnel.

**LOGISTIC
SERVICES:**

FOOD SERVICE
COMMISSARIES
LAUNDRIES
DRY CLEANING
CLOTHING SALES
FUMIGATION AND BATH
PROPERTY DISPOSAL
GRAVES REGISTRATION

The objectives of the program are to:

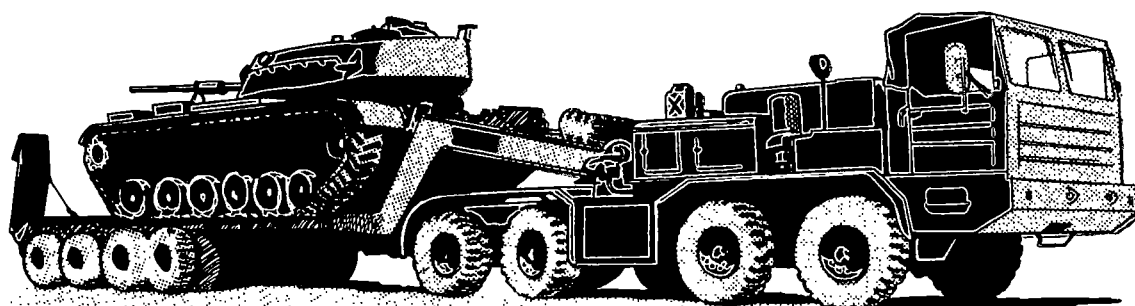
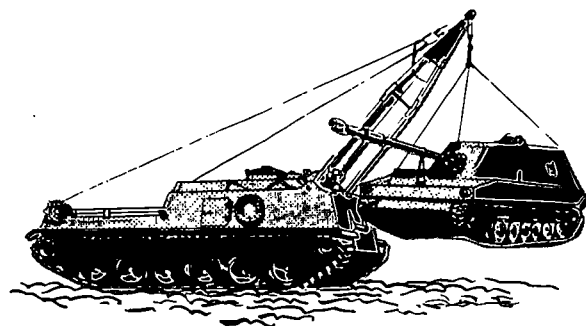
- Provide a nutritionally balanced variety and quantity of subsistence for troop consumption.
- Provide adequate facilities and personnel to handle the receipt, inspection, storage, issue, and sale of food and household supplies and the preparation and service of food.
- Provide continuous training for personnel required to support this program.
- Maintain the highest possible dietary standards for the soldier, both in garrison and in the field.

On the modern battlefield, the intense combat which could take place in a relatively short period of time generally precludes providing hot meals in the combat area. Under such circumstances, field rations are provided in individually packaged meals that can be easily carried and readily consumed by the soldier. This allows the soldier to be sustained while not significantly reducing combat effectiveness. When conditions permit, and rations and cooking equipment are available, troops should be served at least one hot meal daily. In such cases, food preparation should be consolidated at battalion level wherever possible and the meals transported to company level units.



Heavy Equipment Transporters

One of the vital contributions of transportation on the modern battlefield is the mobility generated by the use of heavy equipment transporters, especially in the deployment and evacuation of major items of equipment such as tanks. Recent combat experience has indicated that a significant reduction in weapon system degradation and crew fatigue could be achieved by transporting combat vehicles to the battle area rather than driving them. Also, as was mentioned earlier in Chapter 4 on maintenance, heavy equipment transporters are vital in performing battlefield recovery of damaged equipment that cannot be repaired on the battlefield. Thus, in future conflicts maneuver units will be highly dependent on heavy equipment transporters in deployment, delivering replacement vehicles, evacuating battle casualties, and assisting in redeployment.



HIGHLIGHTS

- Without adequate transportation, the successful accomplishment of the ARMIT, FUEL IT, and FIX IT objectives of logistics would be impossible.
- The Military Airlift Command and the Military Sealift Command provide transportation services from CONUS to and within the theater.
- The Military Traffic Management Command controls the movement of Army cargo and personnel.
- The principal transportation operators in the theater are: the TRANSCOM, the COSCOM transportation units, and the DISCOM transportation unit.
- The principal movement control agencies in the theater are: the TA MCC and the COSCOM MCC.
- Intransit asset visibility is required in order to be able to effectively direct the flow of supplies to the right place at the right time.
- The Army is obtaining the required container handling capability in order to reap the benefits of this transportation revolution.

Issue and Sale of Personal Clothing—

Personal clothing is categorized as initial issue or replacement clothing. Initial issue clothing is given to all enlisted personnel at time of entry into the Army. Replacement clothing in combat areas is provided in-kind, while in other areas, a monetary clothing allowance is provided to each person. During the first six months of service, alterations or replacement of outer clothing is made at government expense. After this period, however, the individual is expected to maintain the clothes by alteration or replacement using the monthly monetary clothing allowance.

Laundry and Bath Services—

Army mobile units furnish laundry, bath, and emergency clothing impregnation service to units in the field. All work processed by these units is on a non-reimbursable basis. In the theater, this service is provided by direct support supply and service companies, laundry and renovation companies, or field service companies. When the clothing exchange concept is used, laundry units launder all serviceable clothing turned in by personnel using the bath unit for reissue. When the bundle concept is used, laundry units launder clothing for return to the individual. The laundry and renovation platoons operating in the forward areas are designed solely for support of bath and clothing exchange and do not have sufficient capacity to process seasonal turn-in of clothing. Additional capacity must be provided at the general support level during these peak periods.

The Army Mortuary Affairs Program—

This program is a function of the Adjutant General and includes the recovery, identification, care, and disposition of deceased persons to include military, Army civilian, eligible civilian contractor employees, dependents, prisoners of war, and, in some cases, other US citizens who die in areas outside the United States. The program is divided into four distinct programs:

- Current death program.
- Concurrent return program.
- Graves registration program.
- Return of remains program.

Memorial affairs procedures must be established prior to the conduct of active warfare. The commander's options are keyed to the magnitude of the operation, the number of deceased personnel anticipated, the capability of combat area mortuaries, and the capability to transport remains. The availability of refrigeration, fixed and mobile, is the most constraining factor. Without it, remains must be processed and interred promptly. Upon determination of the policy and procedures to be implemented, commanders are informed of its application to their command, technically qualified personnel are assigned to appropriate levels, and personnel at the lower levels are trained in the established procedures.

Property Disposal—

According to AR 700-126, property disposal is the act of getting rid of excess, surplus, foreign excess, or any other property under proper authority. Property disposal activities identify, report, screen, and process for transfer, excess personal property and dispose of surplus and foreign excess personal property through donation, sale, abandonment, or destruction. In the theater, disposition of materiel is coordinated and directed by materiel management centers.

Excess property is the property which is

in the possession of any component of the DOD and which exceeds the quantity required or authorized for retention by that component. Surplus property is that which is excess to all Federal agencies, including the DOD, as determined by the General Services Administration. For the Department of Defense, the Defense Logistics Agency (DLA) serves as the integrated program manager for the Defense Personal Property Program. To carry out its responsibilities in relation to excess and surplus property, DLA established the Defense Property Disposal Service.

Facilities

The facilities function as described in Chapter 2 consists of real property programs and real property maintenance activities pertaining to the operation of utilities, maintenance of real property, minor construction, and other engineering support.

Facilities are significant because of their wide distribution, monetary value, and basic importance to the Army; but they are even more crucial to the overall logistic system because of their impact on all other parts of the system. Base development planning for example, affects, and in turn is affected by, all other logistic considerations including supply, materiel maintenance, transportation, and services.

Base areas in the theater of operations are primarily located in the vicinity of ports, beach landing areas, and airfields. Base development is the planning for and the

improvement or expansion of resources and facilities of an area to support military operations. It establishes the time-phased facility requirements for port operations, transportation, hospitalization, maintenance, communications, and all other activities supporting extended military operations.

The establishment of equitable and reasonable standards of living is a concern of commanders at all levels. Policy must be established at the highest level and aggressively enforced down through command channels. Soldiers naturally tend to improve their living conditions at every opportunity; and will divert critical materials and potentially productive manpower to do so. The result can have a significant effect on troop morale and the overall war effort. The policy must prescribe the standard for living under identified levels of austerity.

CHAPTER 7

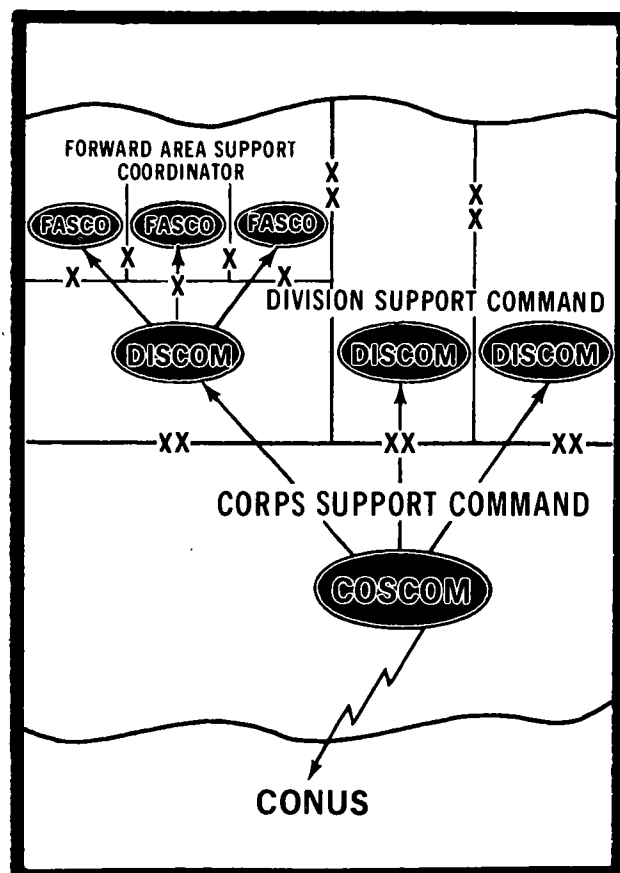
LOGISTIC COMMAND AND CONTROL

The logistic mission has been described as: to develop and maintain maximum combat power through the support of weapon systems. It has also been pointed out that those logistic support functions that are critical to the battle must be conducted as far forward as practicable. Consequently, in order to effectively accomplish the logistic mission, command and control of logistic operations must be focused as far forward as are the operations themselves.

Organizational Command and Control

The command and control of logistic operations begins in the using unit. Appropriate action must take place here if the logistic system is going to provide the right support, in the right place, at the right time. In order to provide better support to combat systems, studies are underway concerning the most effective assignment of logistic functions at this level to enable company commanders to devote their time to mission training requirements in peacetime and fighting the battle in wartime. Without removing the responsibility for the routine management of operational functions, these studies would consolidate or centralize such things as food service, supply, and maintenance at battalion level. The object being to optimize mission and logistic operations at the user level.

The support of using divisional units in the forward area is coordinated by a forward area support coordinating officer (FASCO) representing the division support command (DISCOM) commander. This officer serves as the connecting link between combat and logistic support elements and insures that



combat elements are provided adequate support. He coordinates the operations of the DISCOM forward support elements located with the brigade they support. As requirements change, these support elements push resources forward and withdraw them when no longer needed. The FASCO reports to the DISCOM commander (through the operations officer, S3) who commands and directs support activities throughout the division in accordance with the changing battlefield situation and priorities established by the division commander.

The DISCOM commander, in providing support to the division, utilizes the division materiel management center (DMMC) as his primary coordinating and control element. This element continually examines weapon system readiness and takes management action to keep them operational. It controls maintenance priorities to insure that the operations of the maintenance battalion optimize weapon system readiness and takes immediate action to obtain critical repair parts when necessary to return a weapon system to combat. The DMMC also coordinates and controls supply operations to move supplies forward and shift support resources to meet operational needs. When division requirements cannot be met by division resources, requests for supplies or assistance are forwarded to the corps support command (COSCOM).

The COSCOM provides integrated general support supply and maintenance to all elements of the corps and direct support to nondivisional corps units. General support is provided by general support technical centers operating under the COSCOM. These centers have been addressed previously in Chapter 4-Maintenance. Each center provides general support maintenance, repair parts supply, end item supply, technical assistance, and battlefield recovery for a group of weapon

systems. General support supply for other classes of supply may be handled by a general supply center for classes I, II, III (Pkg), and IV (except cryptographic items, repairable class II items, and aircraft, airdrop, missile, marine, medical, and rail supplies) and by petroleum and ammunition supply units for classes III (bulk) and V respectively.

The COSCOM commander utilizes a materiel management center (MMC) and a movement control center (MCC) to manage logistic operations throughout the corps. The COSCOM MMC, like the DMMC, continuously monitors the operational readiness of weapon systems and takes action to keep them operational. Supply requisitions are forwarded through the COSCOM MMC directly to CONUS to meet the needs of the corps. The COSCOM MCC, in close coordination with the MMC, provides movement management services within the corps area.

In a multi-corps theater, a theater army headquarters (TAHQ) provides overall management of logistic operations. This headquarters establishes priorities, assigns logistic missions, and allocates resources. The TAHQ also utilizes a MMC to control and manage selected items of supply and maintenance operations which the theater army commander feels are so critical that he must retain control and a MCC to provide theater army level movement management services. In such a theater, the theater army commander may establish one or more theater army area commands (TAACOMs) behind the corps rear boundaries to handle materiel as it passes through the port system and provide support to whatever units are located in its area. This may include some weapon systems support for air defense units or combat units in theater reserve status. It does not normally include carrying back-up supplies or providing back-up maintenance support for the corps.

ADP Support

In order to effectively command and control any operation, the commander must have adequate visibility. The use of automatic data processing (ADP) systems has significantly increased the commander's visibility and has had a tremendous effect on logistic operations. It has allowed the commander to more quickly and accurately know what resources he has available, where they are, and their state of combat readiness. It has allowed stockage levels to be significantly reduced due to the ability to process supply requisitions faster. Now, with these reduced levels, time becomes a critical factor. Since supplies may be reordered daily, stock status should be available instantaneously. ADP systems provide capabilities that must be exploited by the logistician in order to operate effectively in today's environment. They can assist the logistician in setting stock levels to meet demands, determining stock availability, and placing requisitions on the CONUS wholesale base. However, progress towards large complex computers that dictate centralization due to their cost, sophistication, and size must be tempered with the need to keep logisticians at the lowest levels in touch with data that they need in order to operate effectively. Recently, computers have been developed which can put a data processing capability back into the hands of the field logistic operators. The aim in the use of ADP in support of logistic operations must be to exploit advances in the state of the art to the

fullest, while maintaining systems standardization. Standardization provides for systems compatibility, simplified training, reduced costs, and most important, more responsive logistic support.

In view of the vital role ADP plays in the accomplishment of the logistic mission and the vulnerability it has to disruption, damage, or destruction, proper consideration must be given to maintaining continuity of operations in such an eventuality. Such equipment outages are described as short-term or long-term outages. Short-term outages are those that can be overcome in 72 hours or less. These can generally be accommodated by manual effort until the ADP system is again operational. Long-term outages are those in excess of 72 hours. The use of other compatible ADP equipment is generally the best back-up solution for long-term outages. To have such equipment readily available in case of an outage requires prior planning. It may be available elsewhere in the unit, at another command, in the CONUS base, from other Service units, or from the host country. Regardless of the source, back-up support must be planned for and available when its required, in order to insure the continuity of logistic operations necessary to accomplish the logistic mission of *developing and maintaining combat power through the support of weapon systems.*

1 APRIL 1977

The proponent agency for this field manual is the US Army Logistics Center. Users are invited to send comments and suggested improvements to the Commander, USALOGC, ATTN: ATCL-CFL, Fort Lee, VA 23801.

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

PAUL T. SMITH
Major General, United States Army
The Adjutant General

DISTRIBUTION:

Active Army, USAR, and ARNG: To be distributed in accordance with DA Form 12-11B, Requirements for Logistics Management (Qty rqr block no. 329); The Logistical Command (Qty rqr block no. 379); Combat Service Support (Qty rqr block no. 406).

Additional copies can be requisitioned (DA Form 17) from the US Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

3000017486



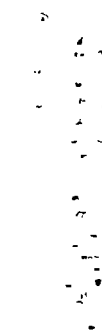
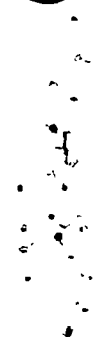
100

100



100







مجلس
العلماء
الاسلاميين
بمصر

الجمعية
الاسلامية
بمصر



الجمعية
الاسلامية
بمصر





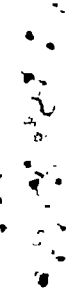
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100







100-100000-100000
400000
10616

